A ROCK ROSE (CISTUS CRISPUS).

SB450.95
.I45
1884-88
V. 7

THE

ILLUSTRATED

DICTIONARY OF GARDENING,

A PRACTICAL AND SCIENTIFIC

Encyclopædia ✣ *of* ✣ *Horticulture*

FOR

GARDENERS AND BOTANISTS.

MISSOURI
BOTANICAL
GARDEN.

EDITED BY

GEORGE NICHOLSON, A.L.S.,

Curator, Royal Botanic Gardens, Kew.

ASSISTED BY PROFESSOR J. W. H. TRAIL, A.M., M.D., F.L.S., IN THE PARTS RELATING TO INSECTS, FUNGI, PLANT STRUCTURE, HORTICULTURAL CHEMISTRY, &C.; AND J. GARRETT IN THE FRUIT, VEGETABLE, AND GENERAL GARDEN WORK PORTIONS.

DIVISION VII.—SCL. TO TUR.

PUBLISHED BY

L. UPCOTT GILL, 170, STRAND, LONDON, W.C.

GENERAL AGENT,

A. W. COWAN, 30 AND 31, NEW BRIDGE STREET, LUDGATE CIRCUS, LONDON.

1887.

LONDON: PRINTED BY A. BRADLEY, 170, STRAND.

REFERENCE TO ILLUSTRATIONS OF PLANTS OTHER THAN THOSE FIGURED IN THIS WORK.

IT has been suggested, by an eminent Authority, that many readers would be glad to be informed where reliable Illustrations could be found of those Plants which are not figured in this Work. To meet this want, references to the figures in Standard Authorities have been given, the titles of the Works referred to being, for economy of space, abbreviated as follows:

A. B. R. ..	Andrews (H. C.). Botanist's Repository. London, 1799-1811. 10 vols. 4to.
A. E.	Andrews (H. C.). Coloured Engravings of Heaths. London, 1802-30. 4 vols. 4to.
A. F. B. ..	Loudon (J. C.). Arboretum et fruticetum britannicum. . . . London, 1838. 8 vols. 8vo.
A. F. P	Allioni (C.). Flora pedemontana. Aug. Taur., 1785. 3 vols. Fol.
A. G.	Aublet (J. B. C. F.). Histoire des plantes de la Guiane française. Londres, 1775. 4 vols. 4to.
A. H.	Andrews (H. C.). The Heathery. London, 1804-12. 4 vols. 4to.
B.	Maund (B.). The Botanist. . . . London, 1839. 8 vols. 4to.
B. F. F. ..	Brandis (D.). Forest Flora of . . . India. London, 1876, 8vo. Atlas, 4to.
B. F. S... ..	Beddome (R. H.). Flora sylvatica. Madras [1869-73]. 2 vols. 4to.
B. H.	La Belgique Horticole. . . Ghent, 1850, &c.*
B. M.	Botanical Magazine. London, 1787, &c. 8vo.*
B. M. Pl. ..	Bentley (R.) and Trimen (H.). Medicinal Plants. London, 1875-80. 8vo.
B. O.	Bateman (James). A Monograph of Odontoglossum. London, 1874. Fol.
B. R.	Botanical Register. London, 1815-47. 33 vols. 8vo.
B. Z.	Botanische Zeitung. Berlin, vols. i.—xiii. (1843-55). 8vo. Leipzig, vol. xiv. (1856).*
C. H. P. ..	Cathcart's Illustrations of Himalayan Plants. London, 1855. Fol.
Enc. T. & S.	Loudon (J. C.). Encyclopædia of Trees and Shrubs. . . . London, 1842. 8vo.
E. T. S. M. ..	*See* T. S. M.
F. A. O. ..	Fitzgerald (R. D.). Australian Orchids. Sydney, 1876. Fol.*
F. D.	Flora Danica—usually quoted as the title of the work, Icones plantarum . . . Daniæ et Norvegiæ. . . . Havniæ, 1761 to 1883. Fol.
F. d. S... ..	La Flore des Serres et des Jardins de l'Europe. 1845-82. 23 vols. 8vo.
Fl. Ment. ..	Moggridge (J. T.). Contributions to the Flora of Mentone . . . London, 1864-8.
Flora	Flora oder allgemeine botanische Zeitung. 1818-42. 25 vols. 8vo. [New Series] 1843, &c.*
F. M.	Floral Magazine. London, 1861-71, 8vo. 1872-81, 4to.
F. & P... ..	Florist and Pomologist. London, 1868-84. 8vo.
G. C.	The Gardeners' Chronicle and Agricultural Gazette. London, 1841-65. Fol.
G. C. n. s. ..	The Gardeners' Chronicle. New Series, 1866, &c. Fol.*
G. G.	Gray (A.). Genera floræ Americæ. . . . Boston, 1848-9. 2 vols. 8vo.
G. M.	The Gardeners' Magazine. Conducted by Shirley Hibberd. London.*
G. M. B. ..	The Gardeners' Magazine of Botany. . . . London, 1850-1. 3 vols. 8vo.
Gn...	The Garden. London, 1871, &c. 4to.*
G. W. F. A...	Goodale (G. L.). Wild Flowers of America. Boston, 1877. 4to.
H. B. F. ..	Hooker (W. J.). The British Ferns.
H. E. F. ..	Hooker (W. J.). Exotic Flora, Edinburgh, 1823-7. 3 vols. 8vo.
H. F. B. A. ..	Hooker (W. J.). Flora boreali-americana. . . . London, 1833-40. 2 vols. 4to.
H. F. T. ..	Hooker (J. D.). Flora Tasmaniæ. London, 1860. 2 vols. 4to. This is Part 3 of "The Botany of the Antarctic Voyage of H.M. Discovery Ships *Erebus* and *Terror*, in the years 1839-43."
H. G. F. ..	Hooker (W. J.). Garden Ferns. London, 1862. 8vo.
H. S. F. ..	Hooker (W. J.). Species Filicum.
I. H.	L'Illustration horticole. Gand, 1850, &c. 8vo.*
I. H. Pl. ..	*See* C. H. P.
J. B.	Journal of Botany. . . . London, 1863. 8vo.*
J. F. A	Jacquin (N. J.). Floræ austriacæ . . . icones . . . Viennæ, 1773-8. 5 vols. Fol.
J. H.	Journal of Horticulture and Cottage Gardener. Conducted by Dr. Robert Hogg. London.
J. H. S... ..	Journal of the Horticultural Society. London, 1846. 8vo.*
K. E. E. ..	Kotschy. Die Eiche Europas und des Orients.
L. B. C... ..	Loddiges (C.). Botanical Cabinet. London, 1812-33. 20 vols. 4to.
L. C. B... ..	Lindley (J.). Collectanea botanica. . . . London, 1821. Fol.
L. E. M. ..	La Marck (J. B. P. A. de M. de). Encyclopédie methodique . . . Botanique. Paris, 1783-1817 13 vols. 4to.
L. J. F... ..	Lemaire (C.). Le Jardin fleuriste. Gand, 1851-4. 4 vols. 8vo.
L. R.	Lindley (J.). Rosarum Monographia. London, 1820. 8vo.
L. S. O... ..	Lindley (J.). Sertum Orchidaceum. . . . London, 1838. Fol.
L. & P. F. G.	Lindley (J.) and Paxton (J.). Flower Garden. . . . London. . . . 1851-3. 3 vols. 4to.
M. A. S. ..	Salm-Dyck. Monographia generum Aloes et Mesembryanthemi. Bonnæ, 1836-63 4to.
N.	Burbidge (F. W.). The Narcissus: Its History and Culture. With a Scientific Review of the Genus by J. G. Baker, F.L.S. London, 1875. 8vo.
N. S.	Nuttall (T.). North American Sylva . . . Philadelphia, 1865. 3 vols. 8vo.
P. F. G. ..	*See* L. & P. F. G.
P. M. B. ..	Paxton (J.). Magazine of Botany. London, 1834-49. 16 vols. 8vo.
Ref. B.	Saunders (W. W.). Refugium botanicum. . . . London, 1869-72. 8vo.
R. G.	Regel (E.). Gartenflora, 1852, &c.*
R. H.	Revue Horticole . . . Paris, 1852.*
R. S. H. ..	Hooker (J. D.). The Rhododendrons of Sikkim-Himalaya. London, 1849-51. Fol.
R. X. O. ..	Reichenbach, *fil.* (H. G.). Xenia orchidacea. Leipzig, 1858. 4to.*
S. B. F. G. ..	Sweet (R.). British Flower Garden. London, 1823-9. 3 vols. 8vo. Second Series. London, 1831-8. 4 vols. 8vo.
S. C.	Sweet (R.). Cistineæ. London, 1825-30. 8vo.
S. E. B... ..	Smith (J. E.). Exotic Botany. . . . London, 1804-5. 2 vols. 8vo.
S. F. A... ..	Sweet (R.). Flora australasica . . . London, 1827-8. 8vo.
S. F. d. J. ..	Siebold (P. F. de) and Vriese (W. H. de). Flore des Jardins du Royaume des Pays-Bas. Leide, 1858-62. 5 vols. 8vo.
S. F. G... ..	Sibthorp (J.). Flora græca . . . London, 1806-40. 10 vols. Fol.
S. H. Ivy. ..	Hibberd (Shirley). The Ivy: a Monograph. London, 1872. 8vo.
Sw. Ger. ..	Sweet (Robert). Geraniaceæ, the natural order of Gerania. 1828-1830.
Sy. En. B. ..	Syme (J. T. B.), *now* Boswell. English Botany . . Ed. 3. London, 1863-85. 12 vols. 8vo.
S. Z. F. J. ..	Siebold (P. F. von) and Zuccarini (J. G.). Flora Japonica. . . . Lugd. Bat., 1835-44. Fol.
T. H. S... ..	Transactions of the Horticultural Society. London, 1805-29. 7 vols. 4to.
T. L. S... ..	Transactions of the Linnæan Society. London, 1791-1875. 30 vols. 4to.*
T. S. M. ..	Emerson (G. B.). Trees and Shrubs . . . of Massachusetts. Boston. Ed. 2, 1875. 2 vols. 8vo.
W. D. B. ..	Watson (P. W.). Dendrologia Britannica. London, 1825. 2 vols. 8vo.
W. F. A. ..	*See* G. W. F. A.
W. O. A. ..	Warner (R.) and Williams (B. S.). The Orchid Album. London, 1882. 4to.*
W. S. O. ..	Warner (R.). Select Orchidaceous Plants. London. Series i, 1862-65. Fol. Series ii, 1865-75. Fol.
W. & F. ..	Woods and Forests. 1883-4. 1 vol. 4to.

* Is still in course of publication.

Sclerotia—*continued.*

several are formed on living plants. Among these are the following: In Potato stems, the Sclerotium from *Peziza postuma* is produced; on most herbaceous stems *S. durum* appears in long, black ridges or warts, from which arises a mould (*Polyactis cinerea*), followed, after a time, by *Peziza Fuckeliana*; *S. cepævorum*, which produces *Mucor subtilissimus* on Onions; *S. clavus*, the Ergot of grasses, from which *Claviceps purpurea* is developed; and a Sclerotium which fills the berries of *Vaccinium Myrtillus*, and gives origin to *Peziza* (*Sclerotinia*) *baccarum*. Sclerotia are not themselves a cause of disease in plants, but are organs by which disease-producing Fungi are propagated. When any cultivated plants are attacked by Fungi that produce Sclerotia, the only safe method of treatment is to burn all parts that bear the latter, to prevent the spread of disease the following year.

SCLEROXYLON. A synonym of **Myrsine** (which *see*).

SCOBIFORM. Resembling sawdust.

SCOLIOSORUS. Included under *Antrophyum*.

SCOLOCHLOA. A synonym of *Arundo*.

Scolopendrium—*continued.*

pairs of similar lateral ones; veins usually once forked. *sori* oblique, ½in. to ⅔in. long, one line broad. Philippines. Greenhouse.

S. rhizophyllum (rooting-fronded). *sti.* 1in. to 4in. long, naked, compressed, chestnut-brown below. *fronds* 4in. to 9in. long, lanceolate, from an auricled cordate base, the point tapering out, and frequently rooting. *sori* short, irregular, linear-oblong. North America. See Fig. 452.

S. vulgare (common). Burnt Weed; Christ's Hair; Common Hartstongue. *rhiz.* very stout, often scaly (as well as the stipes and midrib). *sti.* very stout, 4in. to 8in. long. *fronds* 6in. to 18in. long, broadest in the middle, flaccid, bright green; basal lobes usually auricled, converging; margins undulated; midrib stout. *sori* parallel, at right angles to the midrib, very variable in length and number. Europe (Britain). SYN. *S. officinarum*.

The following are some of the best marked varieties of this species:

S. v. acrocladon (branch-tipped). *fronds* very distinct, narrow-linear, crested and branched at the apex.

S. v. claphamii (Clapham). *fronds* forked and crested at the apex, laciniate and lobed on the margins.

S. v. columnare (columnar). *fronds* having the rachis fringed with a narrow, wing-like membrane, leaving only a dense, multifid head. *h.* 6in.

S. v. Coolingii (Cooling's). A form about 4in. broad and high, much branched. The plant is almost spherical in shape.

S. v. crispum (curled). *fronds* 1ft. to 1½ft. long, always barren under cultivation; margins crenated and undulated, imparting a

FIG. 452. ROOTING FROND OF SCOLOPENDRIUM RHIZOPHYLLUM.

SCOLOPENDRIUM (the ancient Greek name of the genus, used by Theophrastus; it was said to be so-called because the numerous parallel lines of fruit resemble the feet of the Centipede, or *Scolopendra*). Hartstongue. Including *Antigramme*, *Camptosorus*, and *Schaffneria*. ORD. *Filices*. A genus comprising about nine species of interesting, stove, greenhouse, or hardy ferns, inhabiting temperate and tropical regions. Sori attached to the veins, oblique with regard to the midrib, or occasionally almost parallel with it, linear or oblong; involucres arranged in pairs, and open towards each other. The species thrive on rockwork; they will also succeed in shady situations, where scarcely any other plant would live. Of *S. vulgare*, the common British Hartstongue, a multitude of varieties are grown in gardens, and present a wonderful series of interesting variations from the normal state of the plant. The best known species and varieties are described below; except where otherwise indicated, all are hardy. For general culture, *see* **Ferns**.

S. Hemionitis (Hemionites-like). Mule's Fern. *sti.* 4in. to 6in. long, slender, slightly fibrillose. *fronds* 4in. to 6in. long, oblong-lanceolate, hastate-cordate at base, with short and rounded, or prominent and almost acute, lobes. South Europe, 1779.

S. Krebsii (Krebs'). A form of *Lomaria punctulata*.

S. officinarum (officinal). A synonym of *S. vulgare*.

S. pinnatum (pinnate). *sti.* compressed, greyish. *fronds* 2ft. to 4ft. long, with an entire terminal pinna, 4in. to 6in. long, and 1½in. to 2in. broad, proliferous at the point, and one to six

handsome, frilled appearance. There are many forms of this variety, the most important of which are: *fertile*, *latum*, and *minus*.

S. v. cristatum (crested). *fronds* branched at the apex, the branches again forked, thus forming a large crest. See Fig. 453.

FIG. 453. SCOLOPENDRIUM VULGARE CRISTATUM.

The form *lato-digitatum* has digitately-branched fronds, and irregularly-laciniate and wavy divisions. See Fig. 454.

Scolopendrium—*continued.*

S. v. densum (dense). A remarkable form, about 3in. high, having the fronds very much branched, so that the plant resembles a green ball, studded over with innumerable points, something like curled parsley. 1882.

S. v. laceratum (torn). *fronds* beautifully crested and curled at the tips, forming large, crisp heads.

FIG. 454. FROND OF SCOLOPENDRIUM VULGARE LATO-DIGITATUM.

S. v. marginatum (margined). *fronds* about 1ft. long, having on the under side, near the margin, a continuous, raised line, which often produces thorn-like processes. A very elegant and distinct variety.

S. v. multifidum (much-cut). *fronds* much-branched and forked at the apex, forming a very handsome, crested head.

S. v. Stansfieldii (Stansfield's). This mainly differs from *crispum* in that the fronds are peculiarly fringed on the edges and crested at the apex. It is a very striking variety.

SCOLYMUS (the old Greek name, used by Theophrastus and other writers as far back as Hesiod). ORD. *Compositæ*. A small genus (three species) of hardy, erect, annual, biennial, or perennial herbs, natives of the Mediterranean region. Flower-heads yellow, terminal or lateral, sessile; involucre ovoid or sub-globose, the few-seriate bracts mucronate or spiny at apex, gradually passing into floral leaves; receptacle conical or elongated; florets ligulate, truncately five-toothed at apex. Leaves alternate, rigid, sinuate-toothed or pinnatifid, with spiny teeth or lobes, often white-spotted above. The roots of *S. hispanicus* are equally as good as *Scorzonera;* the leaves and stalks are eaten as Cardoons by the people of Salamanca; the flowers are employed for the adulteration of Saffron. *S. maculatus* is sometimes cultivated for the sake of its spotted, variegated leaves; seeds of this species only require sowing in the open ground. The perennial and biennial species thrive in common soil, and may be increased by seeds, or by divisions.

S. grandiflorus (large-flowered).* *fl.-heads* solitary, usually terminal; bracts sub-verticillate. May. *l.* slightly villous, decurrent, winged. Stem villous. *h.* 3ft. Mediterranean region, 1828. Perennial.

S. hispanicus (Spanish). Golden Thistle; Spanish Oyster Plant. *fl.-heads* bibracteate, sub-aggregate, in leafy spikes. August. *l.* decurrent, slightly glabrous, winged. *h.* 3ft. South-west Europe, 1653. Biennial. (S. F. G. 825.)

Scolymus—*continued.*

S. maculatus (spotted). *fl.-heads* somewhat corymbose, many-bracted; bracts pectinate. July. *l.* cartilaginous on the margins, decurrent, winged, often white-spotted. Stem simple, glabrous. *h.* 3ft. South Europe, 1630. Annual. (S. F. G. 824.)

SCOLYTIDÆ. An extensive group of small Beetles, often known as "Bark-beetles," because the larvæ of by far the greater number of species feed between the wood and the bark of trees, especially when the trees are dying. The insects, when mature, come out through holes in the bark. They are not, however, the only Beetles that feed in bark; but probably in no other family do so many species possess this habit. They are distinguished by their small size and cylindrical form

FIG. 455. SCOLYTUS GEOFFROYI, (*a*) natural size and (*b*) magnified.

(see Fig. 455), fitting them for their mode of life. They have four joints in each foot, the first joint being decidedly shorter than the next three together. The head is usually narrow, and occasionally it is lengthened into a beak, as in Weevils. The antennæ are clubbed. The colour is almost always some shade of dark grey or brown. The Beetles, after pairing, burrow through the bark, and form below it passages, which are usually straight or nearly so. The females lay eggs along the sides of the passages formed by each pair; and the larvæ, on hatching out from the eggs, burrow away from the main passages, taking the directions least likely to bring them into the burrows of one another. As they grow, they increase the width of their burrows to correspond with their own size, and when full-fed they become pupæ in the ends of the tubes; and from these they emerge as Beetles in the following spring. A considerable number of species have been found in Britain. Of these, some are confined to one kind of tree, while others feed in several different kinds. Most trees are liable to the attacks of several species of these Beetles; and *Coniferæ*, especially Scotch Firs, are peculiarly infested by them. Each species makes tunnels so definite and characteristic in form that a practised entomologist can generally recognise, from the marks in the bark and the wood, the species of Beetle that has

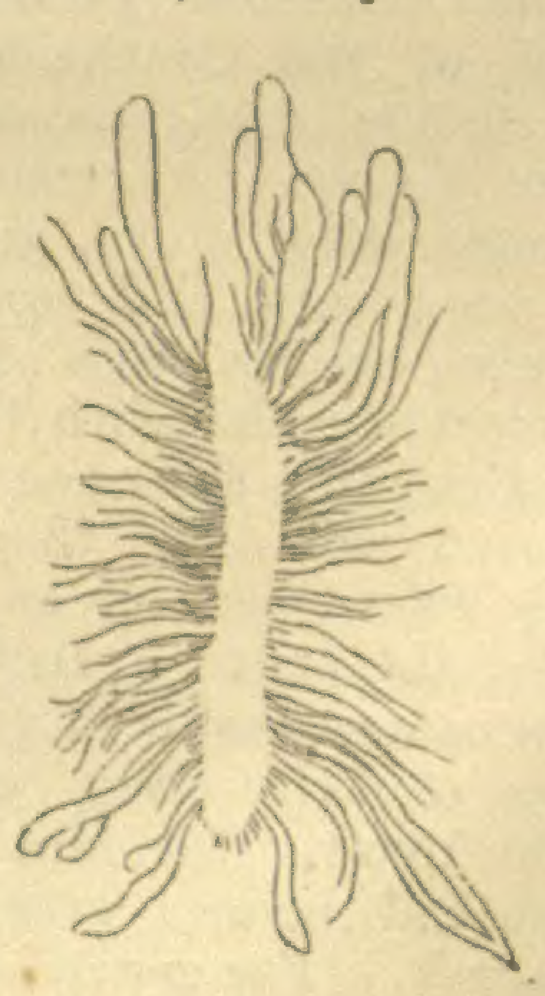

FIG. 456. MARKINGS ON INNER SURFACE OF ELM-BARK OF GALLERIES FORMED BY SCOLYTUS GEOFFROYI (the wide gallery running up the middle is formed by the Female Beetle, the narrow side ones by the Larvæ).

made them (see Figs. 456 and 457). The family *Scolytidæ* has been split up into a number of genera, minor characters being employed for this purpose; but upon these it is unnecessary now to enter, since their habits, the

Scolytidæ—*continued.*

injuries done by them to trees, and the means of preventing or combating their attacks, are much alike in all the species. Fortunately, they seldom appear in quite healthy trees; but if trees have been weakened by any cause (*e.g.*, unfavourable soil, or gases in the soil or in

FIG. 457. ELM TRUNK (much reduced), from which the Bark has been removed from one side to show the Galleries formed by *Scolytus Geoffroyi.*

the atmosphere), their destruction is often completed by these insects in a short time. Examples of this are frequently seen in the destruction by them of Elms and of other trees in public promenades in large towns (*e.g.*, in Paris).

Remedies. The beetles prefer dying or dead wood in which to breed; hence, all such trees should be removed without delay, or, if the trunks are too large to be removed, the bark ought to be torn off and burned. It is well to leave some dead trunks as traps, since the

FIG. 458. OLD BARK OF ELM, showing Holes pierced by *Scolytus Geoffroyi.*

beetles resort to them in preference to living trees, and the logs can be burned with the insects in them. These traps should be renewed about every month during the breeding season, in summer. Where trees show holes (see Fig. 458), the bark should be removed from the infested

Scolytidæ—*continued.*

parts about the end of June. In a short time the larvæ will be dead, and most of them will have been removed by birds. Choice trees may be protected by saturating the outer bark with tobacco solution, or other applications distasteful to the beetles, about the breeding season. The more destructive species in Britain are as follows: On Elms, in avenues, &c., *Scolytus Geoffroyi* (also called *S. destructor* (see Figs. 455 to 458), *S. pygmæus*, and *Hylesinus vittatus*; on Ash, *Hylesinus crenatus* and *H. Fraxini*; on Birch, *Scolytus Ratzeburgi* and (in the wood) *Bostrichus domesticus*; in Beech-wood, *B. domesticus*; on Scotch Firs and other Conifers, *Hylesinus poligraphus, Bostrichus chalcographus, B. typographus, B. Laricis, B. suturalis, B. bidentatus, B. micrographus, B. lineatus, B. cinereus, Hylesinus angustatus, H. palliatus, H. atra, H. piniperda. Scolytus Pruni*, on the Continent, occasionally proves hurtful to fruit-trees, *e.g.*, Apple and Pear.

SCOLYTUS. A genus of **Scolytidæ** (which *see*).

SCOOPS. Tools employed for levelling or rendering smooth the bottoms of drains, when preparing for the drain-pipes. They are usually provided with long handles, and made in several widths, both hollowed and flattened in the sole part, intended for scooping out the soil. Some have the point of the Scoop turned on an angle towards the workman when in use; others turn in the opposite direction.

SCOPARIA (from *scopa*, a broom; the plants may be used for sweeping purposes). ORD. *Scrophularineæ.* A genus comprising five or six species of much branched herbs or small shrubs, natives of Mexico and South America, one being broadly dispersed over all warm regions. Flowers white, yellow, or pale bluish, rather small, on axillary or twin pedicels; calyx four or five-parted; corolla four-cleft. Leaves opposite or whorled, entire or toothed, dotted. Two species have been introduced—*S. dulcis* (Sweet Broom) and *S. flava*—both herbaceous; but they are probably lost to cultivation.

SCOPOLIA (named in honour of John Anthony Scopoli, 1732-1788, Professor of Natural History at Pavia, and author of botanical works). SYN. *Scopolina.* Including *Anisodus* and *Whitleya.* ORD. *Solanaceæ.* A small genus (three species) of hardy, erect, scarcely branched, perennial herbs; one is European, the second Japanese, and the third Himalayan. Flowers lurid-purple or greenish, veined, nodding; calyx truncate or broadly and shortly five-lobed; corolla ample, the limb five-angled or very shortly five-lobed; stamens five; pedicels solitary, filiform. Leaves membranous, entire. Two of the species have been introduced. They thrive in a light, dry soil, and in a shady situation. Propagation may be effected by division of the roots. *S. carniolica* is a very desirable plant, on account of its pretty flowers being produced in spring.

S. carniolica (Carniolan).* *fl.* ¾in. long, solitary, axillary, nodding; corolla lurid-red, yellow or green within; peduncles ¾in. to 1¼in. long. April. *l.* entire, petiolate, 3in. to 3½in. long, ovate or obovate-oblong, sub-cuspidate; petioles ½in. long. *h.* 1ft. or more. Russia, &c., 1780. (B. M. 1126, under name of *Hyoscyamus Scopolia.*)

S. lurida (lurid). *fl.* axillary; corolla at first green, then yellowish, at length purplish; peduncles ½in. to 2in. long. September. *l.* petiolate, ovate, acute, undulated, wrinkled, the larger ones 6in. to 7in. long, mostly unequal, glabrous above, slenderly-tomentose and canescent beneath. *h.* 4ft. to 6ft. Nepaul, 1824. (S. B. F. G. 125, under name of *Whitleya stramonifolia.*)

SCOPOLIA (of Smith). Included under **Toddalia** (which *see*).

SCOPOLINA. A synonym of **Scopolia** (which *see*).

SCORDIUM. Included under **Teucrium** (which *see*).

SCORIAS. A synonym of *Carya*.

SCORODONIA. Included under **Teucrium** (which *see*).

SCORPIOID. "A form of unilateral inflorescence which is circinately coiled in the bud; in the stricter sense, a form with the flowers two-ranked, these being thrown alternately to the right and left" (Asa Gray).

SCORPION GRASS. A common name for *Myosotis*.

SCORPIURUS (from *scorpios*, a scorpion, and *oura*, a tail; alluding to the twisted form of the legumes). Caterpillar Plant. ORD. *Leguminosæ*. A genus comprising about half-a-dozen species of hardy, nearly stemless or decumbent herbs, natives of South Europe, North Africa as far as the Canary Isles, and Western Asia. Flowers yellow, often small, solitary or umbellate on axillary peduncles, nodding. Pods sub-terete, tubercled or muricated, circinate-involute. Leaves simple, entire, continuous with the petioles. The species are not very beautiful, and are rarely cultivated in this country. *S. vermiculata* is a trailing annual. Seeds should be sown in the open border, during spring, and the young plants treated as other hardy annuals.

FIG. 459. FRUITING BRANCHLET AND DETACHED POD OF SCORPIURUS VERMICULATA.

S. vermiculata (worm-shaped-podded). *fl.* solitary on the peduncles; standard streaked with red. June and July. Pods thick, glabrous, with the inner ribs almost obsolete, but the ten outer ones bear crowded stipitate tubercles, which are obtusely dilated at apex. *l.* tapering into the petioles. 1621. See Fig. 459.

SCORZONERA (from old French *scorzon*, Catalonian *scurzon*, a serpent; in allusion to the cooling, anti-febrile effects of *S. hispanica*, which was formerly employed in Spain, on account of these properties, for the cure of serpent bites). Viper's Grass. Including *Podospermum*. ORD. *Compositæ*. A large genus of hardy, glabrous, floccose-woolly, or hairy, perennial or rarely biennial or annual herbs. About 120 species have been described; but probably the number entitled to that rank is less than 100; they inhabit Europe, North Africa, and Central and Western Asia. Flower-heads yellow or purple, often rather large, on long peduncles; involucre cylindrical or campanulate, with imbricated, acute or acuminate bracts in many series; receptacle naked or

Scorzonera—*continued.*

foveolate; florets ligulate, truncately five-toothed at apex; achenes linear, sub-terete, or the outer ones angular, glabrous or villous. Leaves alternate, sometimes entire and grass-like or broader, sometimes more or less pinnately lobed or dissected. *S. hispanica* is cultivated in gardens for the use of its long, tapering roots, which are cooked in a similar way to those of Salsafy. Their outside skin is black; but the inside flesh is white. Seeds should be sown at the end of March, or any time during April, in drills 1ft. apart, and the plants, when large enough, thinned to 6in. or 8in. asunder. An open situation is preferable, and deep soil, which should not be newly manured for the crop. The roots will be ready for use in November, and on through the winter. Some should be lifted before frost sets in, and stored in sand, in a cool shed, to be ready for use whenever required. All the other species may be grown from seeds, sown in the open border, in spring, and the seedlings afterwards thinned out. The perennials may be increased by division of rootstocks, either in autumn or just when growth begins in spring.

The species best known to cultivation are described below; except where otherwise stated, they are perennials.

S. coronopifolia (Buckhorn-leaved). *fl.-heads* yellow, one to a stem; involucral scales mucronate, the outer ones ovate. June and July. *l.* lanceolate, mostly pinnatifid; lobes linear, unequal. Stems erect, nearly simple, leafy at base. *h.* 1ft. North Africa, 1818.

FIG. 460. SCORZONERA HISPANICA.

S. hispanica (Spanish).* Common Viper's Grass. *fl.-heads* yellow; involucre oblong, the scales slightly glabrous, acuminated. June to September. *l.* amplexicaul, lanceolate, undulated or slightly toothed, glabrous or somewhat pubescent. Stem branched; branches naked, one-headed at apex. Root nearly the shape of a carrot, but smaller and dark-coloured,

Scorzonera—*continued.*

pure white internally, of a sweet and agreeable flavour. *h.* 3ft. South Europe, &c., 1576. See Fig. 460.

S. laciniata (torn). *fl.-heads* yellow; involucral scales slightly hooked at the apex. June and July. *l.* pinnatisect; lobes linear, entire. Stems sub-erect, naked and one-headed at the apex. *h.* 2ft. South Europe, 1640. Biennial.

S. mollis (soft). *fl.-heads* yellow, the rays purplish beneath; involucre, as well as the elongated, sub-corymbose peduncles, woolly-villous. June and July. *l.* linear-subulate, keeled, woolly-villous; old ones nearly glabrous; young ones undulately crisped on the margins. *h.* 1½ft. Caucasus, 1818. (B. M. 3027.)

S. purpurea (purple). *fl.-heads* purplish; involucre cylindrical, the scales broadly lanceolate, not ciliated; achenes smooth. May and June. *l.* linear-subulate, channelled, triquetrous. Stems branched, two to five-headed. Root cylindrical-fusiform. *h.* 2ft. Eastern Europe, &c., 1759. (J. F. A. 35.)

S. p. grandiflora (large-flowered). A more showy and much stouter plant than the type, with larger flowers. (B. M. 2294.)

S. p. rosea (rosy). *fl.-heads* rose-pink; involucral scales lanceolate, acuminate; achenes sulcate, muricated above. July. *l.*, radical ones elongated, linear-lanceolate, flat, glabrous; cauline ones few, carinate-linear. Stems simple, one-headed. *h.* 1½ft. Eastern Europe, &c., 1807.

S. undulata (undulated).* *fl.-heads* purplish-rose, 2in. to 2½in. in diameter; involucre cylindric, white-downy; peduncles slender, green or purplish. July. *l.*, radical ones nearly 1ft. long, narrowly linear-lanceolate, entire, rather long-petiolate, with a yellow midrib; cauline ones 3in. to 6in. long, gradually narrowed from a broad, sessile base to a very fine point. Stem 1ft. to 2ft. high, slender, branched. Algeria and Morocco, 1874. (B. M. 6127.)

SCOTCH BONNETS. A common name for *Marasmius oreades.*

SCOTCH PINE. *See* **Pinus sylvestris.**

SCOTCH PRIMROSE. A common name for *Primula scotica.*

SCOTTEA (named in honour of R. Scott, M.D., Professor of Botany in Dublin). ORD. *Leguminosæ.* A monotypic genus, now included, by Bentham, under *Boissœa.* The species and its varieties are elegant, greenhouse, evergreen shrubs, thriving in sandy peat. Propagated freely by cuttings of the young wood, inserted in sand, under a glass.

S. dentata (toothed). *fl.* orange-red or yellow, more or less tinged with green, on solitary pedicels; calyx ¼in. to ⅓in. long, with short, obtuse teeth; standard ½in. to ⅝in. long; keel and wings over ⅜in. long; bracts broad and rigid, but very deciduous. Summer. *l.* opposite, varying from broadly ovate-cordate or triangular to hastate-lanceolate or almost linear, ½in. to 1in. long, acute or obtuse, irregularly denticulate. *h.* 3ft. to 7ft. Australia, 1803. (L. B. C. 1458.)

S. d. angustifolia (narrow-leaved). *l.* hastate-lanceolate to almost linear; margins revolute. 1825. (B. R. 1266, under name of *S. angustifolia.*)

S. d. hastata (halberd-shaped). *l.* ovate-hastate or hastate-lanceolate, ⅜in. to above 1in. long, ¼in. to ½in. broad. 1833. (B. 134 and B. R. 1233, under name of *S. dentata*; B. R. 1652, under name of *S. lævis.*)

SCRAPERS. Scrapers of some description should be placed in various positions in gardens, particularly at points where there are paths cut in the ordinary soil joining others with a gravel surface. It matters little what sort is used if they are securely fixed into blocks of wood to keep them firm.

SCREENS. A shrubbery or belt of fast-growing trees is termed a Screen, when planted for affording shelter to a garden, an orchard, or any separate part of a garden requiring protection from an unfavourable quarter. Gardens on the sea-coast invariably need a shelter or Screen from the wind and salt spray; this is generally provided by planting a belt of trees or shrubs that are known to succeed in such situations. The term also denotes anything erected or grown to hide an unsightly object from any particular point, such as from one of the principal walks in a garden. This may be done effectually, if only to a moderate height, by lattice-work, with Ivy or other creepers trained upon it, and more extensively by free-growing trees and evergreen shrubs. There are numerous methods of forming Screens;

Screens—*continued.*

some are of general application, but there are many instances where special preparations have to be made to meet peculiar local requirements.

SCREW PINE. *See* **Pandanus.**

SCREW-TREE. A common name for *Helicteres.*

SCROBICULATE. Marked by tiny depressions.

SCROFULA-LEAF, or **SCROFULA-WEED.** A name applied to *Goodyera pubescens.*

SCROPHULARIA (so named in reference to its former supposed benefit in cases of scrofula, owing to the resemblance of the roots of some species to scrofulous tumours). Figwort. ORD. *Scrophularineæ.* A genus comprising about 120 species (which number may, according to Bentham and Hooker, be reduced to 100) of mostly hardy, often fœtid, annual, biennial, or perennial herbs or sub-shrubs, broadly dispersed over the extra-tropical regions of the Northern hemisphere. Flowers greenish-purple, lurid-purple, or yellow, generally rather small, in paniculate, thyrsoid cymes; calyx deeply five-cleft or five-parted; corolla tube ventricose, globose or oblong; lobes five, short and flat, the four upper ones erect, the lowest spreading; perfect stamens four, the fifth usually rudimentary. Leaves opposite, or the upper ones alternate, entire, cut, or dissected, often pellucid-dotted. *S. aquatica* (Brook or Water Betony, &c.), *S. nodosa* (Murrain Grass, &c.), and *S. Scordonia,* are natives of Britain, while *S. vernalis* has become naturalised. Few of the species have any horticultural value. Only one calls for mention here. It thrives in ordinary garden soil, as a pot plant, in a cool frame, and may be multiplied by seeds.

S. chrysantha (golden-flowered).* *fl.* ½in. long, drooping; corolla golden-yellow, ovoid, turgid, contracted at the mouth; cymes densely packed in the upper leaf axils, forming a rounded head 2in. in diameter. March. *l.* 2in. to 3in. broad, ovate- or orbicular-cordate, lobulate and toothed, convex, wrinkled. *h.* 6in. to 18in. Caucasus, &c., 1882. A stout, erect biennial. (B. M. 6629.)

SCROPHULARINEÆ. A natural order of herbs, sub-shrubs, shrubs, or small trees, found in all climates, but mostly in temperate regions. Flowers hermaphrodite, often irregular; calyx inferior, persistent, with five, rarely four, teeth or lobes; corolla gamopetalous; limb of five or four, very rarely six or eight, equally spreading lobes, or more or less bilabiate, with the upper lip entire, emarginate, or bilobed, and the lower one trilobed and often spreading; stamens often four, didynamous, or two, alternating with the corolla lobes; anthers two-celled, sometimes one-celled by the confluence of the sutures across the top of the connective; inflorescence variable. Capsules variable, dehiscent, or rarely baccate and indehiscent. Leaves, in a few genera, all alternate, in most cases the lower ones (or all) opposite or whorled, the upper and floral ones often alternate, entire, toothed, or rarely variously lobed or dissected; stipules none. Many of the species are of medicinal value: chief among these is the Foxglove. The order is a most important one from a horticultural standpoint, contributing, as it does, so many beautiful plants to our gardens. It embraces, according to Bentham and Hooker, 157 genera and nearly 1900 species, and is divided by those authors into twelve tribes: *Antirrhineæ, Aptosimeæ, Calceolareæ, Cheloneæ, Digitaleæ, Euphrasieæ, Gerardieæ, Gratioleæ, Hemimerideæ, Leucophylleæ, Manuleieæ,* and *Verbasceæ.* Among the many well-known genera, the following may be cited as examples: *Antirrhinum, Calceolaria, Chelone, Digitalis, Mimulus, Pentstemon,* and *Verbascum.*

SCROTIFORM. Pouch-like.

SCRUBBY OAK. *See* **Lophira africana.**

SCRUB OAK. *See* **Quercus Catesbæi.**

SCURF. A condition often met with in Potato tubers, in which the surface shows clefts or slits, beneath which lie black masses of rotting tissue. Observation of the cause shows this to be, in part at least, the presence of superfluous moisture in the soil. This favours greatly the production of what are known as lenticels, or small groups of loosely-arranged cells below the stomata. These loose cells increase, and readily absorb water from the exterior. The swelling bursts the outer skin of the tuber, forming the slits, and giving still more free access to water. Cork is formed to repair the injury; but is also burst by increased growth of the lenticel, and is renewed to repair the injury as far as possible. The cells saturated with moisture begin to decay, and offer a favourable occasion of entrance to the spores of Fungi; hence, in a short time, the tissues below the slits become blackened and soft, the cells show Fungus threads, and the starch is removed from the neighbouring cells. Even where the actual amount of material destroyed is small, the unsightly appearance of the tubers frequently lessens the value of the crop. The best remedy is good drainage, together with efficient means to loosen the soil, and to permit free access of air.

The term "Scurf" is also applied to the loose, scaly matter on the epidermis.

SCURFY PEA. *See* **Psoralea.**

SCURVY GRASS. *See* **Cochlearia officinalis.**

SCUTATE, SCUTIFORM. Having the form of a small, round buckler.

SCUTELLARIA (from *scutella*, a dish or platter; alluding to the form of the fruiting calyx). Helmet Flower; Skull-cap. SYN. *Cassida*. ORD. *Labiatæ*. A genus comprising about ninety species of stove, greenhouse, or hardy, annual or perennial herbs or sub-shrubs, decumbent or diffuse, rarely erect and tall, very rarely shrubs; they are scattered over temperate regions and the tropical mountains. Flowers blue, violet, yellow, or white, solitary or in pairs, axillary or in terminal spikes or racemes; calyx campanulate, two-lipped, the tube dilated opposite the posterior lip into a broad, flattened, hollow pouch, both lip and pouch deciduous in fruit, the anterior lip closed after flowering, persistent; corolla tube long, naked inside; limb bilabiate, the upper lip entire or notched, the lower dilated, its lateral lobes free and spreading, usually connate with the upper lip, rarely with the lower; stamens four. Nutlets sub-globose or depressed. Leaves often toothed, sometimes pinnatifid or entire; floral ones conformed or changed into bracts. *S. galericulata* and *S. minor* are the British representatives of the genus. The species described below are, for the most part, very handsome when in flower, and hence are well suited for ornamenting the front of flower borders. Any common garden soil is usually suitable. The herbaceous species may be increased by seeds, or by divisions; and the shrubby kinds may be readily multiplied by cuttings. *S. Mociniana* is one of the most beautiful of stove, flowering plants, and may be easily grown by anyone with a cool stove or warm greenhouse temperature. The bunches of flowers are freely produced —one on the point of almost every shoot—and are very bright and effective. Cuttings of half-ripened shoots root readily in spring, or at almost any season, in a warm propagating-frame. Young plants should have their points pinched out once or twice when growing, to encourage a bushy habit, and so insure a much larger production of flowers. Nice little specimens may be grown in 5in. pots. They succeed best in loam and leaf soil or decayed manure, with some sand intermixed. Except where otherwise indicated, the species here given are hardy, herbaceous perennials.

S. albo-rosea (white-and-rose). *fl.* borne in long, terminal racemes; corolla lilac, becoming paler towards the base of the long tube. Summer. *l.* ovate-oblong, cordate at base, undulated.

Scutellaria—*continued.*

Stem tetragonal. *h.* 1½ft. Woods of the upper Amazons, 1859. Stove shrub. (I. H. 584.)

FIG. 461. SCUTELLARIA ALPINA.

S. alpina (alpine).* *fl.* in oblong, tetragonal spikes; corolla wholly purple or with the tube or lower lip yellow, 1in. to 1½in. long. August. *l.* sub-sessile or shortly petiolate, ovate, slightly acute, rounded or cordate at base, loosely-crenate, serrate, six to ten lines long, pubescent or pilose; floral ones coloured, imbricated. Stems procumbent, often rooting at base. Europe and Central Asia, 1752. See Fig. 461. (A. F. P. 26, fig. 3; B. R. 1460; S. B. F. G. 90.) The variety *lupulina* has entirely yellow flowers. (B. R. 1493, under name of *S. lupulina.*)

S. aurata (golden-flowered). *fl.* numerous, erect, in a terminal raceme; corolla yellow, very long, tubular-infundibuliform; pedicels short; bracts linear, reflexed. Summer. *l.* on rather long petioles, ovate, obtuse, acuminate, auriculate-cordate at base, the lobes approximate, entire, or obsoletely and remotely denticulate. Stem tetragonal. *h.* 1ft. to 1½ft. Brazil, 1863. Stove perennial. (I. H. 1862, 368.)

S. a. sulphurea (sulphur-coloured). *fl.* of a pale sulphur-colour, smaller than in the type. (B. M. 5525.)

S. Columnæ (Columna's). *fl.* opposite, secund; corolla dark purple, ten to twelve lines long, loosely pubescent outside, the throat dilated; pedicels as long as the fruiting calyx; racemes 6in. or more long, loose, slightly branched, pilose. July. *l.* petiolate, ovate, 2in. long, crenate, broadly cordate or truncate at base, scarcely wrinkled, slenderly pubescent; floral ones ovate. Stem erect, 2ft. to 3ft. high, branched, pubescent. South Europe, 1806. (S. B. F. G. 52.)

S. costaricana (Costa Rica).* *fl.* numerous, racemose, sub-secund; calyx (and pedicel) dark purple, small; corolla of a rich golden-scarlet, the inside of the lips a deep yellow, 2½in. long, erect, tubular-infundibuliform. June. *l.* ovate, acuminate, serrate-dentate; petioles rather long. Stem dark purple, erect. *h.* 1½ft. to 3ft. Costa Rica, 1863. A beautiful stove perennial. (B. M. 5439.)

S. galericulata (skull-cap). *fl.* secund. pubescent, solitary; corolla blue, variegated with white inside, ⅔in. long, the tube curved; bracts leaf-like; pedicels very short. July to September. *l.* shortly petiolate, ½in. to 2½in. long, oblong or ovate, cordate at base, obtuse or sub-acute, rather remotely crenate-serrate. Stems 6in. to 18in. long, slender, simple or branched. Europe (Britain), &c. (Sy. En. B. 1060.)

S. grandiflora (large-flowered). *fl.* in tetragonal, oblong spikes, which are eventually 1½in. long; corolla purplish, smaller than in *S. orientalis*. July. *l.* long-petiolate, somewhat roundish-ovate, incised-toothed, softly tomentose beneath or on both sides; floral ones entire, imbricated, pubescent. Stems procumbent. Altaian Alps, Siberia, 1804. (B. M. 635.) SYN. *S. pulchella.*

S. Hartwegi (Hartweg's).* *fl.* scattered, in loose, simple racemes; corolla bright red, 1in. long, with a violet lower lip. Summer. *l.* ovate, slightly acuminate, unequally crenate-serrate, roundly

Scutellaria—*continued.*

truncate or loosely cordate at base, green above, purple, and puberulous on the veins, beneath; petioles puberulous. *h.* 1ft. to 2ft. Quito, 1882. A very ornamental, stove sub-shrub. (B. M. 6615.)

S. incarnata (flesh-coloured). *fl.* in terminal, secund spikes; calyx tubular, compressed; corolla flesh-coloured or pale reddish-violet, pubescent, six times longer than the calyx, with a spreading limb. Summer. *l.* petiolate, ovate, deeply serrated, 1in. to 3in. long, intense green, pubescent above, tomentose beneath; floral ones linear-lanceolate, equalling the pedicels. Stem erect, 2ft. high, pubescent. Central America, 1856. Stove perennial. (B. M. 4268.)

S. i. Trianai (Triana's). This variety chiefly differs from the type in the much richer rose-scarlet of its corolla, and in the smaller, glabrous foliage. (B. M. 5185.)

S. japonica (Japanese). *fl.* opposite, loose; calyx slightly pilose; corolla blue, six to eight lines long, pubescent; racemes loose-flowered, 6in. long. Summer. *l.* petiolate, ovate, obtuse, deeply crenate, rounded or truncate at base, glabrous; lower ones 1½in. long; floral ones gradually becoming smaller. Stems prostrate at base; branches ascending. Japan. (P. M. B. x. 123.)

S. Lehmanni (Lehmann's). *fl.* bright red-scarlet, disposed in short, terminal racemes. Summer. *l.* cordate, petiolate. Stems erect. *h.* 1ft. to 2ft. Columbia, 1884. An ornamental stove perennial. (R. G. 1152, fig. 1, a-c.)

S. macrantha (large-flowered). *fl.* opposite, secund; calyx pilose; corolla blue, 1in. long, the tube much dilated upwards, the hood incurved; racemes many, simple. August. *l.* sessile, lanceolate, obtuse, entire, nearly glabrous, ciliated; floral ones longer than the calyx. Stem procumbent at base, ascending, often purplish, nearly glabrous. Eastern Asia, 1827. (B. M. 4420.)

S. minor (lesser). Hedge Hyssop. *fl.* pale pink-purple, ½in. long. July to October. *l.* shortly petiolate or sessile, ½in. to 1in. long, obtuse, with one or two crenatures near the base; upper ones quite entire. *h.* 4in. to 6in. Europe (Britain), &c. Habit resembling *S. galericulata*, but smaller. (Sy. En. B. 1061.)

S. Mociniana (Mocini's).* *fl.* opposite, secund; calyx one-sixth the length of the corolla; corolla showy, bright scarlet, 1½in. to 1½in. long, with the inside of the lip yellow and the tube clothed with short, fine hairs, the limb erect. Summer. *l.* petiolate, ovate, sub-sinuate-crenate, slightly hispid above, nearly glabrous beneath; lower floral ones conformed, the upper ones small, oblong. *h.* 1½ft. Mexico, 1868. A very beautiful stove shrub. (Gn., Sept. 1, 1877; I. H. 562; R. H. 1872, 350.)

S. orientalis (Oriental).* *fl.* in oblong, tetragonal spikes; corolla yellow, or with the lower lip fuscous or purplish, 1in. to 1½in. long. August. *l.* petiolate, ovate, incised-toothed, four to ten lines long, hoary beneath; floral ones entire, membranous, slightly imbricated. Stems creeping, and often rooting from the base, ascending, slenderly cano-tomentose. South Europe and Central Asia, 1729. (B. M. 2120; S. B. F. G. 45.)

S. parvula (rather small). *fl.*, calyx as long as the pedicels; corolla violet, pubescent, twice or thrice the length of the calyx. Summer. *l.* ovate, or the uppermost ones ovate-lanceolate, sessile by a truncate or slightly cordate base, about ½in. long, some of the lower ones with one or two coarse teeth, the lowest slender-petiolate. Roots tuberous. *h.* 4in. to 10in. North America, 1822. Plant branching from the base, usually erect. (H. E. F. 106.)

S. pulchella (pretty). A synonym of *S. grandiflora.*

S. purpurascens (purplish). *fl.* in terminal, loose racemes; corolla ¾in. long, the tube and upper lip bright blue, the lower lip dark violet with a median white stripe. Summer. *l.* on long petioles, broadly ovate, obtuse, sinuate-crenate, very broadly truncate, rounded, or sub-cordate at base, slightly hispid above, or glabrous on both sides. *h.* 1ft. to 2ft. South America, 1880. A useful, decorative, greenhouse perennial. (B. M. 6464.)

S. serrata (serrated). *fl.*, corolla blue, fully 1in. long, nearly glabrous, with a narrow tube, a moderately ampliate throat, and a rather narrow upper lip; raceme simple or rarely a pair of racemes at the base of the terminal one. August. *l.* three to five pairs, ovate or ovate-oblong, coarsely and sharply serrated, acute or acuminate, mostly acute at the base, 2in. to 4in. long; upper floral ones entire and lanceolate. Stem 1ft. to 2ft. high. North America, 1800. (A. B. R. 494.)

S. splendens (splendid).* *fl.* scattered; corolla scarlet; ten to eleven lines long, the tube elongated, slender, the lobes shortened; racemes simple, elongated. October. *l.* petiolate, broadly ovate, obtuse or scarcely acuminate, 4in. to 5in. long, deeply cordate at base, hairy on both sides; floral ones minute. Stems ascending, branched, hairy or pubescent. *h.* 1ft. Mexico, 1841. Stove perennial. (B. M. 4290, under name of *S. cordifolia.*)

S. Ventenatii (Ventenat's). *fl.*, calyx small; corolla scarlet, elongated, many times longer than the calyx, the upper lip deeply four-cleft; bracts very deciduous, narrow, the lower ones sub-ovate; racemes terminal, elongated, sub-secund or sub-distichous. August. *l.* long-petiolate, rather thick, cordate-ovate, somewhat obtuse, deeply-serrated. *h.* 1½ft. Santa-Martha, 1844. An erect, branched, softly pubescent, greenhouse perennial. (B. M. 4271.)

S. villosa (villous). *fl.* glandular-villous; corolla scarlet, the tube elongated, slenderly funnel-shaped, the lobes shortened; bracts small; racemes terminal, many-flowered, short, corymbose. July. *l.* petiolate, cordate-ovate, soft, acuminate, deeply sinuate-toothed, wrinkled, pilose, purple beneath. Stems acutely tetragonal, branched. *h.* 1½ft. Peru, 1842. Stove shrub. (B. M. 4789; F. d. S. 961.)

SCUTELLIFORM. Platter-shaped.

SCUTICARIA (from *scutica*, a whip; alluding to the shape of the leaves). ORD. *Orchideæ.* A small genus (two species) of stove, epiphytal orchids, one Brazilian, the other a native of Guiana. Flowers very handsome; sepals sub-equal, erecto-patent, the lateral ones adnate with the foot of the column forming a prominent chin; petals rather smaller; lip sessile, articulated, broad and concave, the lateral lobes large, erect, the middle one small and spreading; pollen masses four; scapes one-flowered, growing from the sides of the stem. Leaves very long, fleshy, sub-terete, furrowed, continuous with the stem. Stems very short, fleshy, one-leaved, at length scarcely fleshy-thickened. The species thrive either on blocks or in baskets with sphagnum. During the growing season an abundance of water must be supplied to the roots. Propagation may be effected by divisions, made as growth is commencing.

S. Hadwenii (Hadwen's). This is the correct name of the plant described in this work under name of *Bifrenaria Hadwenii.*

S. Steelii (Steel's).* *fl.* primrose-yellow, with reddish-brown blotches, large, fragrant; lip marked with brownish-crimson, especially on the lateral lobes, the crest having three orange-coloured teeth in front; scape one to three-flowered. *l.* one on each branch of the ebulbous rhizome, terete, 2ft. to 4ft. long, channelled, tapering to a fine point. British Guiana, 1834. SYN. *Maxillaria Steelii* (B. M. 3573; B. R. 1986; W. O. A. ii. 55).

SCUTULA. A synonym of **Memecylon** (which *see*).

SCYPHANTHUS. A synonym of **Grammatocarpus** (which *see*).

SCYPHULARIA. Included under **Davallia** (which *see*).

SCYTALIA. Included under *Nephelium.*

SCYTALIS. A synonym of **Vigna** (which *see*).

SCYTANTHUS (of Hooker). A synonym of **Hoodia** (which *see*).

SCYTHES. Since the introduction of mowing machines, these have not been so extensively used in gardens. The ordinary form of handle and blade answers well for mowing grass where no machine is kept, and also for cutting it where a machine cannot conveniently be worked. A Scythe for lawn-mowing should be "hung" differently from those used amongst long field-grass. The stick and handles should be attached so that the edge of the blade may be slightly raised above ground when the back is resting on the ground. The workman should be careful to avoid, so far as possible, what is called "ribbing"—that is, mowing so as to show the marks of the Scythe after the grass has been swept up and taken away. This is scarcely possible unless the blade has been properly attached to the handle for the special purpose of cutting short lawn-grass.

SEA BEET. A common name for *Beta maritima.*

SEA BELLS. A common name for *Calystegia Soldanella.*

SEA BUCKTHORN. *See* **Hippophæ.**

SEAFORTHIA. A synonym of **Ptychosperma** (which *see*). The plant so well known in gardens as *S. elegans* is *Ptychosperma Cunninghamiana. S. coronata, S. Kuhlii*, and *S. malaiana*, are garden names of *Pinanga coronata, P. Kuhlii*, and *P. malaiana* respectively.

SEA HEATH. *See* **Frankenia.**

SEA HOLLY. A popular name for *Eryngium maritimum* and other species.

SEA KALE (*Crambe maritima*). A hardy, herbaceous perennial, a native of Britain. It is very extensively cultivated in gardens as a vegetable for forcing, and for use in spring when the season's growth commences. The young shoots and leaf-stalks are the parts cooked when they are crisp and well blanched. The stronger these can be obtained, the better; the chief object is, therefore, to cultivate with a view to securing good, large roots and crowns previous to forcing them. Sea Kale may easily be raised from seed, which should be sown in an open situation at the end of March, or early in April, according to the state of the soil. Sow in drills 12in. apart, and thin the young plants to about 6in. asunder in the rows for the first year. Before the next spring, the roots must be lifted, and replanted in rows from 2ft. to 2½ft. apart, for growing into a size large enough for use. All the crowns and buds at the top must be cut off before replanting, and the roots inserted so that their tops are 1in., or even 2in., below the surface. Sometimes, Sea Kale is sown at wider distances than those above given, and the plants allowed to grow for two years without being transplanted, when the tops may be blanched and used; but when thus treated the tops of the crowns must be cut off, to prevent the plants seeding the second year. The greater part of the Sea Kale plants grown specially for forcing are raised from cuttings made from the roots. When a quantity of fully-developed

FIG. 462. SEA KALE.

crowns are lifted for forcing, there are plenty of pieces to be detached from the main root; these are sometimes called thongs, and any about 4in. in length will do for planting. They should be cleanly cut through with a knife, the upper end straight, and the lower or smaller end on an angle, in order that each may be readily distinguished at planting time, which will be in the following March, or early in April. Meanwhile, during winter, these prepared root-cuttings must be buried in a heap of sandy soil. All the larger roots that have been forced may also be cut over and replanted, but it is advisable to keep growing some young ones each year. The roots covered with soil will have been forming shoots by early spring all round the crowns; they should be planted about 1ft. apart, in trenches, which require to be 2ft. asunder, to allow the leaves to develop. The crown portion of the cutting must be placed so as to be covered with soil. The numerous shoots which appear may, in due course, be reduced to one, the strongest; this will then grow rapidly, if the soil is rich and of good depth. After the leaves die away in autumn, the roots, if intended for forcing under glass, may be lifted, covered temporarily with soil, and protected until required for introducing into heat. During this process, any pieces of roots large enough for cuttings may be collected and treated for another year in the way

Sea Kale—*continued.*

above described. Root cuttings taken from plants that have not been forced are much stronger and superior to those saved from forced and, consequently, weakened stocks.

Forcing. Sea Kale is one of the easiest of plants to force, provided heat is very gradually applied: it will not withstand a high temperature at first. An easy method, where a supply of crowns has been prepared, is to place several nearly close together in large pots, and stand them in a temperature of about 45deg., turning an empty pot over the top, to exclude light. The floor of a mushroom-house is generally a good place, and, as this structure is usually kept dark, the shoots become blanched as they grow without being covered. They should be cut for use when at the stage represented in Fig. 462, and detached at the crown as shown. Sea Kale may also be forced in the ground by inverting over it large pots specially made for the purpose, and covering with fermenting material. A gradual heat is necessary, a very little at first is sufficient to excite growth. Light must always be excluded during the forcing process, in order to insure thorough blanching.

SEA LAVENDER. A popular name for various species of *Statice.*

SEAL-FLOWER. A common name for *Dicentra spectabilis.*

SEA MILKWORT. *See* **Glaux.**

SEA PINK. *See* **Armeria.**

SEA ROCKET. *See* **Cakile.**

SEASIDE GRAPE. *See* **Coccoloba.**

SEASIDE GROUNDS AND PLANTS. The Seaside, as generally understood, is the coast-land immediately adjoining the sea, and, consequently, exposed to the influences of strong sea-breezes, and, with these, plenty of salt spray. Both have their evil effect on trees, and, with some exceptions, on plant-life generally; but as Seaside residences are so numerous, and most of them have some sort of a garden attached, it may be of service to note some of the trees and plants best suited for protecting and rendering them attractive. On exposed parts of the sea-coast it is invariably necessary to plant, so far as may be practicable, a screen or broad belt of trees and shrubs that are sure to be capable of withstanding the exposure, and eventually affording protection for more tender subjects. Hurdles have to be placed round plants during winter, and numerous other contrivances resorted to for affording protection. Plants which, perhaps, thrive well just out of the reach of the salt spray may, and often will, succumb when exposed to it; and the wind may blow on certain points with great violence, while a short distance off it may seldom be seriously felt. The arrangement of Seaside Grounds should, therefore, be in the hands of someone with a knowledge of the locality, and of the amount of exposure that preparation has to be made for contending against. A screen of trees and shrubs is usually much better than a wall for a protection; the wind passes over the latter with destructive violence, while its force becomes, as it were, lost on a mass of foliage. It is, however, often as much of a difficulty to get screen-plants established as it is those which are intended to be screened because of being tender or more ornamental. Only small or moderate-sized specimens should be inserted, even for forming screens, or they will be rocked about by the wind before the roots can get a hold, and, consequently, will not answer permanently.

Some of the trees and shrubs most likely to succeed in very exposed situations on the sea-coast are: *Euonymus japonicus*, *Tamarix gallica* (a most valuable and exceedingly hardy plant for forming screens), *Escallonia*

Seaside Grounds and Plants—*continued.*

macrantha, Phillyreas, Berberries, Cotoneasters, thick-leaved Rhododendrons, Evergreen Oak (*Quercus Ilex*), Elders, the Sea Buckthorn (*Hippophae rhamnoides*), Gorse (*Ulex Europæus*), Ivies, thick-leaved Hollies, Willows, common Junipers, *Rosa spinosissima*, *R. rubiginosa* (Sweet-briar), *R. rugosa*, &c. Amongst Pines, the hardiest are *P. austriaca*, *P. Laricio*, and *P. Pinaster*.

SEASIDE POPPY. A common name for *Glaucium flavum*.

SEA STARWORT. A common name for *Aster Tripolium*.

SEA THRIFT. *See* **Statice Limonium.**

SEATS. As resting-places in the pleasure-grounds, park, and woods of a gentleman's domain, Seats are always necessary adjuncts; for the croquet-ground, cricket-ground, &c., they are indispensable. In the gardens of the suburban villa, and of the cottage, they are alike in request. Seats may be of classic design, the work of the sculptor and architect, upon the nobleman's terrace; logs of wood, placed informally at the base of some large tree, in the park; a simple rustic plank, with a more or less grotesque back rail formed of crooked branches, for the shrubbery and the woods. But, as a rule the above are not admissible into dressed grounds. The inventive faculties of manufacturers of garden furniture have of late years placed within the reach of all classes a variety of Seats much more enjoyable and convenient than the uncomfortable rustic Seats of former times.

Most of the large furnishing ironmongers, in the principal towns, supply Seats suitable for the margins of walks, croquet-grounds, and other places (where a considerable number of persons require accommodation), that will each afford rest to from six to eight persons; some of these have a back to shut down over the Seat to keep it dry—the "Windsor," the "Osborne," and the "Sandringham," are good examples — others are fitted with awnings, and very ingenious mechanism for opening and closing the same at pleasure. In some, the "awning" forms a screen at the back: by this contrivance persons using the Seat are secured from the chill east winds that prevail in spring and early summer, and which often render the employment of an open Seat dangerous to health. The awnings also form an agreeable screen from the scorching sun at a later period. These Seats, whilst the most desirable, are not out of keeping in any position in the pleasure-grounds. The framework of the Seats above described is of iron, having laths of pitch pine or other durable wood bolted on to form the seat and back; the whole is painted or stained and varnished.

Of chairs, there is an almost endless variety; most of them are very light, and easy to transfer from place to place as occasion may require. They are framed of iron, with wood laths, as described above, or with light steel spring laths, which are more yielding than the wood. Some are made with elbow rests, some to fold up, an[...] others to rock. The names given to these, in the [...] are "Desideratum," "Gwyder," "Spring lounges," [...]us, ½in. across; spring chairs," &c. It is desirable that this [...]nceolate, spreading furniture should be carefully stored in a [...]; flower-stems erect, house, during the winter months, as [...] ⅛in. to ¼in. long, crowded, depends upon the perfect stat[...] base, having an acrid taste; and in the spring, when t[...]scattered. Barren stems creeping, be attended to. [...] slender-cylindrical, rooting near the [...]. Plant glabrous, evergreen. See Fig. 464.

The Seats fitted [...]e commonest British species, of which the are movable; but [...]s are worth notice: may often find a [...]lden).* *l.* and tips of the shoots bright golden-comfortable retreat [...] A charming variety, admirably suited for spring the scenery. Sho[...]iving colour at a dull time of the year. Less a bench, say fr[...]type. against it.

Seats—*continued.*

height, and covered with rough bark or thatch, the ends being closed with boards, also covered with bark, or rough trellis work, and a floor constructed with pebbles or blocks of wood. The wall at the back should be lined with India matting, and a Rose or Honeysuckle trained over the structure, the width of which may be from 3ft. to 5ft. Similar Seats, but constructed independently of a wall, with bark or thatch coverings, may be erected in the more distant parts of the grounds, woods, &c., as shelters in case of sudden showers. In such places, they should have a closely-boarded back and ends, covered with rough bark or heather, and the structure should be flanked by shrubs. Cold draughts should be prevented from entering at the back of the Seat, by stuffing all crevices with moss, and, if a greater degree of ornamentation is desired, patterns in hazel rods or mosses may be worked on the inside surfaces.

SEAWEEDS. "A general term for the plants comprehended in the order *Algæ* of the Linnæan class *Cryptogamia*, known as flowerless plants. It includes not only plants growing in the sea, as the name Seaweed implies, but also in fresh water, and on moist earth, rocks, stone, and living and diseased vegetable substances, in the form of slime and jellies" (Smith).

Seaweeds are very largely used as manure in many districts around the British coasts, and in the Channel Islands, and are much esteemed for this purpose, owing to their richness in the foods required by plants, and to their rapid decay after being dug or ploughed into the ground. They are regarded as peculiarly useful in promoting the growth of Potatoes, and also as beneficial to Turnips; in fact, they especially assist the growth of plants that contain a good deal of water in their tissues when mature. Besides the Seaweeds themselves, the masses of them employed as manure have usually mixed up among them a good deal of decaying animal matter, from dead sea-animals on or in the plants, and this adds considerably to their value. They are very rich in Potash and Soda compounds, but rather poor in Phosphates; hence, it is well to mix with them some bone-dust, or other manure rich in Phosphates, before spreading them on the soil. *See also* **Manures.**

SEBÆA (named after Albert Seba, 1665-1736, an apothecary and botanical author, of Amsterdam). ORD. *Gentianeæ*. A genus comprising abo[...] Summer. [...]pecies of stove or greenhouse, erect, [...]obtuse, contracted at base. tropical and Southern Africa [...]ng, rooting, terete, olive-brown, New Zealand. Flowers [...] Europe (Britain). Plant glabrous, numerous, in corymbos[...]me when in flower. (Sy. En. B. 529.) and long-pedicellate [...]d *S. neglectum* (of gardens). The following calyx four or [...]um (short-leaved). *l.* shorter and thicker than in drical, at le[...] twisted [...] [...]icranthum (small-flowered). *fl.* smaller than in the [...]ies. *l.* on the barren shoots ascending, not spreading, Lea[...]flattened on both surfaces.

S. a. teretifolium (terete-leaved). *fl.*, sepals and petals obtuse. *l.* much flattened above. (Sy. En. B. 529.)

S. amplexicaule (stem-clasping). *fl.* golden-yellow, numerous, secund; sepals furrowed outside; petals ¼in. long, keeled, twice the length of the sepals; cymes two-forked, leafy, with a solitary flower in the fork; flower-stems decumbent, ascending, 6in. to 9in. long. Summer. *l.* dilated and membranous at base, tapering to a long, awl-shaped point; those of the flower-stems alternate, ascending, sessile, ½in. long. Branches 2in. to 4in. long, wiry, ascending, clothed with imbricating leaves. Mediterranean region. A curious, glabrous, evergreen species. The ends of the shoots swell out into small, scaly tubers.

S. Anacampseros (Anacampseros). *fl.* violet, numerous, but rarely produced, about ¼in. in diameter; cymes dense, terminal, globose, with a few small leaves intermixed; flower-stems erect, terete, reddish. July. *l.* orbicular or obovate, obtuse, apiculate, cordate, auricled at base, with reddish margins. Branches erect, rooting at the nodes. Central Europe, 1596. Plant glaucous, evergreen. (B. M. 118.)

Secale—*continued.*

hardy, annual, erect grasses, broadly dispersed over the Mediterranean region. Flowers in a dense, terminal spike. Leaves flat. *S. cereale* (Rye) as a corn crop in this country is gradually diminishing by the substitution of wheat.

SECAMONE (altered from *Squamona*, the Arabic name of *S. ægyptiaca*). ORD. *Asclepiadeæ*. A genus comprising about two dozen species of stove, twining or decumbent, much-branched shrubs or sub-shrubs, natives of tropical and South Africa, tropical Asia and Australia, and the Mascarene Islands. Flowers small, often minute; calyx five-parted; corolla tube shortly rotate, deeply five-cleft; coronal scales five, shortly or deeply connate with the staminal tube; cymes loosely bi- or trichotomous, or clustered and few-flowered, sessile or shortly pedunculate. Leaves opposite, coriaceous or membranous, sometimes pellucid-dotted. Three species have been introduced, but they are probably lost to cultivation.

SECATEUR. An instrument used for pruning, extensively in France, and also, of late, in this country. Sécateurs are small, hand pruning-shears; there are various forms of them made. They can be used much more expeditiously than a pruning-knife for shortening summer shoots, pruning Roses, &c.; but they do not make a clean cut like a knife. *See also* **Pruning-Knives.**

SECHIUM (said to be derived from *sekos*, a pen or fold; the fruit being sometimes used for fattening hogs in the West India Islands.) SYN. *Chayota*. ORD. *Cucurbitaceæ*. A monotypic genus. The species is a half-hardy, slightly hispid, climbing, perennial herb. The fruits are commonly employed as an article of food by the natives of the West Indies, being considered extremely wholesome; they are occasionally sent to England in a fresh state, and are sold in our markets under the name of Chayotes. The plant is grown in South Europe and in tropical Africa and America. For culture, *see* **Gourds.**

S. edule (edible). Chaco, Chayota, or Chocho Plant. *fl.* yellow, monœcious, disposed in elongated racemes, sub-fasciculate, shortly pedicellate; corolla rotate, deeply five-parted. June. *fr.* fleshy, about 4in. long, obovoid, oblong, or pear-shaped, sulcate, one-seeded. *l.* membranous, cordate, angled or lobed. Stems ... from ... Root large and fleshy, sometimes weighing ... ling a yam in appearance, and having a ... thongs, and any ... ed. *h.* 6ft. to 12ft. Native country ... 51.)

planting. They should be ...
the upper end straight, and ... ic, but unorganised, sub-
on an angle, in order that eac... f plants.
tinguished at planting time, which wi... s: *e.g.*, the pollen
March, or early in April. Meanwhi...
these prepared root-cuttings must be buried ...
sandy soil. All the larger roots that have bee... lassifica-
may also be cut over and replanted, but it is adv... nera,
to keep growing some young ones each year. The roots
covered with soil will have been forming shoots by early
spring all round the crowns; they should be planted about
1ft. apart, in trenches, which require to be 2ft. asunder,
to allow the leaves to develop. The crown portion of the
cutting must be placed so as to be covered with soil. The
numerous shoots which appear may, in due course, be
reduced to one, the strongest; this will then grow rapidly,
if the soil is rich and of good depth. After the leaves
die away in autumn, the roots, if intended for forcing under
glass, may be lifted, covered temporarily with soil, and
protected until required for introducing into heat. During
this process, any pieces of roots large enough for cuttings
may be collected and treated for another year in the way

Securidaca—*continued.*

bilobed keel. July. *l.* 1½in. to 2in. long, ovate-lanceolate, ovate, or oblong, pointed or blunt, puberulous beneath. *h.* 10ft. to 15ft. Tropical America, 1824. An erect shrub.

S. virgata (twiggy). *fl.* variegated, odorous, distant; corolla yellow; wings rosy on the outside, white within; racemes terminal, filiform, drooping. July. *l.* eight to ten lines in diameter, rounded at both ends or sub-emarginate; those of the flowering branchlets much smaller. West Indies, 1739. A high climber.

SECURIDACA (of Gærtner). A synonym of **Securigera** (which *see*).

SECURIGERA (from *securis*, a hatchet, and *gero*, to bear; referring to the shape of the pods). SYNS. *Bonaveria*, *Securidaca* (of Gærtner). ORD. *Leguminosæ*. A monotypic genus. The species is a hardy annual, only requiring to be sown in the open border in spring.

S. Coronilla (Coronilla-like). Axe-weed; Hatchet Vetch. *fl.* yellow, at the tips of axillary peduncles, nodding; petals free of the staminal tube; standard sub-orbiculate. July. *l.* impari-pinnate; leaflets entire; stipules small, membranous. *h.* 1ft. South Europe, &c., 1562. (S. F. G. 712, under name of *Coronilla Securidacea.*)

SECURINEGA (from *securis*, a hatchet, and *nego*, to refuse; in reference to the extreme hardness of the wood). Including *Geblera*. ORD. *Euphorbiaceæ*. This genus embraces about eight species of stove, greenhouse, or hardy, branched shrubs, inhabiting temperate and tropical regions. Flowers monœcious or diœcious, apetalous, glomerate at the axils; males small, numerous, subsessile; females fewer or solitary. Leaves alternate, entire, often small. Only one species calls for description here, and it is doubtful if that is still cultivated. It thrives in any rich, loamy soil. Propagated readily by cuttings of the half-ripened wood, inserted in sand, under a glass, in heat.

S. Commersoni (Commerson's). A synonym of *S. durissima*.

S. durissima (very hard-wooded). Otaheite Myrtle. *fl.* white; males sub-sessile; females at length somewhat spreading, reflexed; calyx silky-pubescent. June. *l.* usually oblong-ovate, acute, shortly narrowed into the petioles. *h.* 35ft. Mauritius, &c., 1793. Stove. This is the *Bois dur* of the colonists. SYNS. *S. Commersoni*, *S. nitida*.

S. nitida (shining). A synonym of *S. durissima*.

SEDGES. A common name for the *Cyperaceæ*, of which *Carex* is the principal genus.

SEDUM (from *sedeo*, to sit; alluding to the manner in which the plants fix themselves on rocks and walls). Orpine; Stonecrop. Including *Rhodiola*. ORD. *Crassulaceæ*. A genus comprising about 120 species of mostly hardy, glabrous or glandular-pubescent, fleshy, erect or

SEDUM.

...-like herbs, rarely
...perate and frigid
... are rare in

we...
as muc...
as it is tho...
of being tend...
moderate-sized sp...
forming screens, or th...
wind before the roots can ge...
will not answer permanently.
Some of the trees and shrubs mo...
in very exposed situations on the sea-...
mus japonicus, *Tamarix gallica* (a mo...
exceedingly hardy plant for forming scr...

Sedum—*continued.*

rarely pink or blue, cymose (see Fig. 463), in a few cases axillary and solitary; calyx four or five-lobed; petals four or five (rarely six or seven), free; stamens eight to ten (rarely twelve to fourteen); filaments filiform or subulate. Leaves very variable, opposite, alternate, and whorled, entire or serrate, rarely laciniate. Sedums are amongst the easiest of plants to grow; like Saxifrages and Sempervivums, they succeed in almost any position, on rockwork, old walls, or ruins, or in the mixed border. Some are specially adapted for use in carpet bedding, *S. lydium* being an example. *S. acre*, and its variety *aureum*, though common, are plants much favoured by almost everybody, and allowed to spread extensively. *S. spectabile* is a fine, herbaceous border plant, also equally well adapted for pot culture. All Sedums are readily propagated by seeds, by cuttings, or by division of the tufts in spring. They prefer an open, loamy soil, and to grow amongst stones, but, as before noted, they thrive in almost any position.

By the assistance of the following key, adapted from Dr. Masters' admirable monograph on the "Hardy Stonecrops" (published in the "Gardeners' Chronicle" for 1878), any of the hardy species may be readily identified.

I. Herbaceous Perennials.

Flowers unisexual: *S. Rhodiola.*

Flowers bisexual.

Leaves narrow, entire, toothed, or deeply divided: *S. Aizoon, S. asiaticum, S. Maximowiczii, S. Middendorffianum, S. quadrifidum, S. rhodanthum, S. Selskyanum, S. Semenovii, S. trifidum.*

Leaves flat, broad, toothed, but never deeply divided (TELEPHIUM group): *S. erythrostictum, S. maximum, S. spectabile, S. telephioides, S. Telephium.*

II. Evergreen Perennials.

Leaves flat and broad.

Leaves wholly, or at least those on the barren shoots, in tufts or rosettes: *S. Beyrichianum, S. Nevii, S. obtusatum, S. spathulifolium, S. ternatum, S. umbilicoides.*

Leaves scattered, not tufted.

Stems erect: *S. populifolium.*

Stems, at least the barren ones, prostrate, creeping.

Flowers yellow: *S. hybridum, S. japonicum, S. kamtschaticum.*

Flowers pink, rose-coloured, or white: *S. Anacampseros, S. Ewersii, S. oppositifolium, S. Sieboldi, S. stoloniferum.*

Leaves thick, more or less terete.

Leaves sharply pointed.

Flowers yellow or greenish-yellow: *S. amplexicaule, S. anopetalum, S. nicæense, S. pruinatum, S. reflexum, S. rupestre, S. sarmentosum, S. stenopetalum.*

Flowers lilac or white: *S. pulchellum.*

Leaves blunt at the tip.

Flowers yellow: *S. acre, S. Hildebrandi, S. sexangulare.*

Flowers white or pink: *S. album, S. anglicum, S. arboreum, S. brevifolium, S. dasyphyllum, S. farinosum, S. glaucum, S. lydium, S. monregalense, S. multiceps.*

III. Annuals or Biennials.

Stamens ten to twelve.

Leaves flat, tufted on the barren shoots: *S. sempervivoides.*
Leaves more or less cylindrical: *S. cæruleum, S. glandulosum.*

A selection of the best-known species is given below; they are hardy, herbaceous perennials, except where otherwise indicated. For most of the descriptions we are indebted to the monograph above quoted.

S. acre (bitter). Wall Pepper. *fl.* yellow, numerous, ½in. across; sepals like the leaves, half the length of the lanceolate, spreading petals; cymes one-sided, two to five-forked; flower-stems erect, 2in. to 3in. high. Summer. *l.* minute, ⅛in. to ¼in. long, crowded, thick, conical, obtuse, gibbous at base, having an acrid taste; those on the flower-stems scattered. Barren stems creeping, branched, about 2in. long, slender-cylindrical, rooting near the base. Europe (Britain). Plant glabrous, evergreen. See Fig. 464. (Sy. En. B. 532.) The commonest British species, of which the following varieties are worth notice:

S. a. aureum (golden).* *l.* and tips of the shoots bright golden-yellow in spring. A charming variety, admirably suited for spring bedding, or for giving colour at a dull time of the year. Less hardy than the type.

S. a. elegans (elegant). *l.*, young ones and tips of the shoots of a pale silvery colour. This is not so effective as *aureum*, and is more delicate.

S. a. majus (large). *fl.* ⅔in. across; sepals linear-oblong, slightly gibbous at base; petals twice the length of the sepals; cyme two-parted, with a central sessile flower, the branches recurved, one-sided. *l.* in seven rows, closely crowded, thick, deltoid-ovoid, scarcely auricled at base. Plant larger and more robust than the type. A distinct plant, regarded by Dr. Masters as "perhaps even deserving of specific rank."

S. Aizoon (Aizoon).* *fl.* yellow, numerous, ½in. in diameter, in a loose, panicled cyme, 1in. to 3in. in diameter; lower peduncles axillary, distant; upper ones umbellate, flat-topped. Late summer. *l.* distant, sessile, alternate, 2½in. by ⅔in., oblong-lanceolate, coarsely and irregularly toothed for the greater part of their length; midrib prominent. Stems glabrous, 1ft. or more high, sub-angular, several from the same crown, erect, unbranched. Siberia, &c., 1757. An old inhabitant of our gardens.

FIG. 464. SEDUM ACRE.

S. albicans (whitish). A garden form of *S. Telephium.*

S. album (white).* *fl.* white, nearly ⅓in. across; petals lanceolate, spreading, twice the length of the calyx; cymes 2in. to 3in. in diameter, corymbose, much-branched, many flowered; flower-stems pinkish, erect, 4in. to 6in. high. Summer. *l.* alternate, spreading, ½in. long, linear-oblong, obtuse, contracted at base. Barren shoots erect or creeping, rooting, terete, olive-brown, sometimes slightly tubercled. Europe (Britain). Plant glabrous, tufted, evergreen, handsome when in flower. (Sy. En. B. 529.) SYNS. *S. farinosum* and *S. neglectum* (of gardens). The following are varieties:

S. a. brevifolium (short-leaved). *l.* shorter and thicker than in the type.

S. a. micranthum (small-flowered). *fl.* smaller than in the species. *l.* on the barren shoots ascending, not spreading, flattened on both surfaces.

S. a. teretifolium (terete-leaved). *fl.*, sepals and petals obtuse. *l.* much flattened above. (Sy. En. B. 529.)

S. amplexicaule (stem-clasping). *fl.* golden-yellow, numerous, secund; sepals furrowed outside; petals ¼in. long, keeled, twice the length of the sepals; cymes two-forked, leafy, with a solitary flower in the fork; flower-stems decumbent, ascending, 6in. to 9in. long. Summer. *l.* dilated and membranous at base, tapering to a long, awl-shaped point; those of the flower-stems alternate, ascending, sessile, ½in. long. Branches 2in. to 4in. long, wiry, ascending, clothed with imbricating leaves. Mediterranean region. A curious, glabrous, evergreen species. The ends of the shoots swell out into small, scaly tubers.

S. Anacampseros (Anacampseros). *fl.* violet, numerous, but rarely produced, about ¼in. in diameter; cymes dense, terminal, globose, with a few small leaves intermixed; flower-stems erect, terete, reddish. July. *l.* orbicular or obovate, obtuse, apiculate, cordate, auricled at base, with reddish margins. Branches erect, rooting at the nodes. Central Europe, 1596. Plant glaucous, evergreen. (B. M. 118.)

Sedum—*continued.*

S. anglicum (English).* *fl.* pure white or rosy-tinted, ⅜in. across; sepals less than half the length of the lanceolate petals; cymes dichotomous, few-flowered; flower-stems 2in. long. July. *l.* crowded, alternate, sub-opposite, less crowded on the flower-stems, erect or spreading, ⅛in. to ¼in. long. Barren shoots trailing or erect, 1in. to 2in. long, forming dense, cushion-like masses. Western Europe (Britain). A neat and pretty, glabrous, evergreen species, suitable for rockeries. It is rather difficult to cultivate. (Sy. En. B. 531.)

S. anopetalum (erect-petaled). *fl.* pale greenish-yellow, ½in. across; sepals five to seven, deltoid, grooved; petals erecto-patent, somewhat folded and keeled; cymes dense, flat or concave, umbellate, about 1in. in diameter. July and August. *l.* in eight ranks, approximate, sessile, spreading (or on the flowering shoots ascending), ⅜in. long, terete, awl-shaped, spine-tipped, greyish-green, red at the tips. Branches prostrate or ascending, 4in. to 6in. long. South Europe, 1818. Plant more or less glaucous, evergreen.

S. arboreum (tree-like). *fl.* white, ½in. across, five-parted; petals lanceolate, keeled, twice or more longer than the linear-oblong sepals; cymes terminal, many-flowered. July. *l.* on older shoots deltoid, subulate, terete, or somewhat four-sided, ⅛in. long, horizontally spreading; those on the young shoots more or less crowded, linear, terete, pimpled. *h.* 4in. to 6in. Native place unknown. Plant glabrous, suffrutescent, evergreen, with no separate barren shoots, branching from near the base, the branches spreading.

S. asiaticum (Asiatic). *fl.* greenish-yellow, in compact, terminal, globose cymes, numerous, five-parted; petals twice the length of the sepals; anthers orange-brown. Summer. *l.* opposite, decussate, spreading, sessile, ⅜in. to 1in. by ⅛in. or more, linear-oblong, coarsely and irregularly toothed. Stems annual, 6in. to 12in. high, erect, unbranched, slender, glabrous. Himalayas. Half-hardy or greenhouse.

S. Beyrichianum (Beyrich's). *fl.* white, ½in. across; sepals as long as the petals; cyme forked; fertile stems erect, 2½in. high, with numerous crowded, ascending leaves. *l.* in rosettes, ⅛in. by ⅛in., spathulate, obtuse, tapering to stalks, red-dotted. Native place unknown. Evergreen.

S. brevifolium (short-leaved).* *fl.* ¼in. across; sepals whitish, with a pink midrib, oblong-lanceolate; petals also having a pink midrib, oblong, acute; cyme umbellate, two or three-forked, with a pedicellate flower in the centre of each fork. July. *l.* crowded, in four rows, $\frac{1}{16}$in. long, ovoid, pinkish, densely mealy-pubescent. France, &c. A beautiful little, densely tufted, glaucous, pruinose, evergreen species, with much the habit of *S. dasyphyllum.*

S. carneum variegatum (flesh-coloured, variegated). A form of *S. sarmentosum.*

S. cœruleum (blue).* *fl.* pale blue, five to seven-parted, ¼in. in diameter; sepals half the length of the petals, both oblong, obtuse; cyme loose, many-flowered, 1in. in diameter, with recurved branches. July. *l.* tufted, ¼in. long, oblong, obtuse, pale green, spotted with red. Stems 2in. to 3in. high, branched from the base. Mediterranean region, 1822. Plant glabrous or the inflorescence pilose. A charming little annual or biennial.

S. collinum (hill-loving). A garden synonym *S. reflexum.*

S. corsicanum (Corsican). A corruption of *corsicum*, a name which has been applied to forms of *S. dasyphyllum* and *S. maximum.*

S. corsicum (Corsican), of Duby. A synonym of *S. dasyphyllum glanduliferum.*

S. dasyphyllum (thick-leaved). *fl.* pinkish, ⅜in. across; petals lanceolate, three or four times the length of the fleshy sepals; cymes corymbose, loose, few-flowered. July. *l.* crowded, sessile, spreading, thick, ⅛in. to ¼in. long, oblong, acute, or sub-orbicular, pimpled. Stems tufted, slender, 2in. to 3in. long, branching. Europe (Britain). Plant glaucous, glabrous, or glandular, evergreen. (Sy. En. B. 530.) The form *glanduliferum* (B. M. 6027), often met with in cultivation, is densely glandular-pubescent (SYN. *S. corsicum*, of Duby); while *oblongifolium* has oblong leaves.

S. dentatum (toothed). A garden synonym of *S. stoloniferum.*

S. denticulatum (slightly-toothed). A garden synonym of *S. stoloniferum.*

S. elegans (elegant). A synonym of *S. pruinatum.*

S. erythrostictum (blush-tinted).* *fl.* greenish, nearly ½in. across; petals spreading, lanceolate, flushed with pink, twice the length of the sepals; cymes terminal, corymbose. September. *l.* opposite or alternate, ascending, 2½in. by 1in., concave, oblong, sinuate, obscurely toothed, entire and sub-cuneate or rounded at base, tapering into short petioles or quite sessile. Stem erect, greenish, 1ft. to 1½ft. high. Japan. A handsome species. (Ref. B. 33 and R. G. 709, under name of *S. albo-roseum.*) The form *variegatum* has leaves blotched with yellow.

S. Ewersii (Ewers').* *fl.* pink or pale violet, numerous; petals twice the length of the sepals, dark-spotted; cymes dense, globose. August and September. *l.* opposite, sessile, about ½in. in diameter, sub-orbicular, cordate-amplexicaul, entire or slightly sinuate. Stock thick, giving off many trailing or ascending, slender branches. Siberia, &c., 1829. A rather tender evergreen, well worth pot culture.

Sedum—*continued.*

S. farinosum (mealy). *fl.* white, crowded, five to seven-parted; sepals pink-tipped, linear-oblong, obtuse; petals lanceolate, acute, keeled; cyme two or three-parted. July. *l.* crowded in four to six rows, deciduous, ⅛in. by ⅛in., scarcely forming a rosette, oblong, obtuse. Stems tufted, cylindrical, much-branched. Madeira. Plant glabrous, glaucous, pruinose or mealy, rather tender, evergreen. Probably an outlying insular form of *S. album.*

S. farinosum (mealy), of gardens. A synonym of *S. album.*

S. glandulosum (glandular).* *fl.* pale reddish-purple, ⅓in. in diameter, usually alternate on short, recurved, simple or forked, terminal cymes; petals twice or thrice as long as the calyx. June. *l.* scattered, sessile, ¼in. to ⅜in. long, linear-oblong, obtuse, cylindric. Stems simple or forked, 2in. to 6in. long, sub-erect, decumbent or ascending. Spain, 1871. Whole plant glandular-hairy. Annual. (B. M. 5924.)

S. glaucum (glaucous).* *fl.* pinkish-white, ½in. across, six-parted; sepals deltoid, acute; petals oblong, sharp-pointed at apex; stamens twelve; cymes three to seven-branched, umbellate, the branches spreading, slightly pilose; flower-stems 3in. to 4in. long, reddish. July. *l.* densely crowded, about ¼in. long, linear, greenish-grey, becoming reddish, studded with fine hyaline pimples at the tips. Barren shoots 2in. long, branched. Central and Southern Europe. A very pretty, glaucous, evergreen species, much used for carpet bedding and other purposes. The form *polypetalum* has seven to nine petals.

S. Hildebrandi (Hildebrand's). *fl.* bright yellow, ⅜in. across; sepals lanceolate; petals lanceolate, acute; cyme branches ½in. long. July. *l.* ⅛in. long, densely packed, linear, turgid, subulate, erecto-patent, longer and narrower than in *S. acre.* Hungary. Plant glaucous, evergreen.

S. hybridum (hybrid). *fl.* yellow, numerous; sepals linear, obtuse, half as long as the apiculate petals; cymes terminal, much-branched, inversely pyramidal, 2in. to 3in. in diameter; peduncles horizontal or deflexed, with large, spreading bracts. Summer. *l.* alternate, stalked, about 1in. by 1½in., spathulate, coarsely toothed in the upper half, entire and tapering in the lower part, the teeth red-tipped. Stems creeping, glabrous or glandular-hairy. Siberia, 1776. Evergreen.

S. ibericum (Iberian). A garden form of *S. stoloniferum.*

S. japonicum (Japanese).* *fl.* yellow, ½in. in diameter; sepals oblong; petals lanceolate, acute, twice the length of the sepals; cymes loose, terminal and lateral, panicled, many-flowered. Summer. *l.* scattered or opposite, sub-reflexed, spreading, spathulate, oblong, acute, entire, convex below, channelled above, bright green. Stems diffuse. Japan, 1866. Evergreen. (R. G. 513, f. 3, 4.)

S. kamtschaticum (Kamtschatkan).* *fl.* yellow, numerous, ¾in. across; sepals deltoid, less than half as long as the spreading, apiculate, keeled petals; cymes terminal, umbellate, inversely pyramidal, 1in. to 3in. in diameter; peduncles radiating, with large bracts at base; flower-stems erect, 4in. to 6in. high. Late autumn. *l.* alternate or opposite, 1¾in. by ½in., oblong-obovate, deep green, toothed above the middle, gradually tapering to the petioles; edges minutely papillose. Branches 6in. to 8in. long, greenish or purplish. Stems prostrate. Kamtschatka, 1829. Evergreen. SYN. *S. Selskyanum* (of gardens).

S. Liebmannianum (Liebmann's). *fl.* whitish-pink, small, sessile; cymes terminal, three to five-flowered. Summer. *l.* sessile, clustered, fleshy, shining, spreading, conical, one to two lines long, scarcely acute. Branches red, ascending. *h.* 3in. to 4in. Mexico, 1880. Greenhouse perennial.

S. lividum (livid). A garden synonym of *S. lydium.*

S. lydium (Lydian).* *fl.* pinkish, $\frac{1}{10}$in. across; petals twice as long as the sepals; cyme corymbose, many-flowered; flowering shoots 4in. to 5in. long. Late summer. *l.* crowded, ¼in. long, linear, sub-terete, greenish or red-tipped, auricled at base, tipped with numerous very minute pimples. Barren shoots 2in. to 3in. high, erect, purplish. Asia Minor, 1867. A charming little, glabrous evergreen for rockwork edgings or carpet bedding. SYN. *S. lividum* (of gardens).

S. Maximowiczii (Maximowicz's). *fl.*, yellow, numerous, in a dense, flat, spreading cyme; sepals unequal, protracted into a long, slender point; petals half as long again as the sepals. Late summer. *l.* sub-opposite or alternate, sub-sessile, 1in. to 1½in. long, oblong-ovate or oblong-lanceolate, sometimes obtuse, regularly toothed, the midrib channelled; upper ones longer and narrower. Stems erect, about 1ft. high, terete or somewhat four-sided, greenish. Japan, Amur.

S. maximum (largest).* *fl.*, sepals deltoid-lanceolate, half the length of the lanceolate, whitish petals, whose tips are spotted with red; cymes terminal and lateral, on long stalks, forming a loose panicle, sub-globose, many-flowered, the lowest stalks usually longest. August and September. *l.* opposite, sessile, spreading, stem-clasping, 2¾in. long, ovate, acute, more or less cordate, crenate-toothed. Stems 1ft. to 2ft. high, erect, green or purple. Europe and Asia. The following varieties are enumerated by Dr. Masters:

S. m. assurgens (increasing). *fl.* pinkish; cymes corymbose; inflorescence loose. *l.* ascending, opposite, green, oblong, obtuse, sinuate. Stem weak, ascending, green.

Sedum—*continued.*

S. m. cordifolium (cordate-leaved). *fl.* whitish, with red spots, ½in. across; petals concave; inflorescence corymbose. *l.* alternate and opposite, spreading horizontally, oblong-ovate, sinuate-toothed. Stems purplish. (Ref. B. 34, under name of *S. cordifolium.*)

S. m. corsicum (Corsican). *fl.* pale yellow, with a pleasant, apple-like fragrance; inflorescence corymbose. *l.* alternate and opposite, spreading, oblong-ovate, toothed, green. Stems purplish.

S. m. hæmatodes (bloody).* *fl.* whitish, the petals tipped with red; cymes numerous, long-stalked, forming a large, loose, inversely pyramidal panicle, with a few scattered leaves. September. *l.* opposite, 5in. by 3in., oblong-ovate, obtuse, sub-cordate, coarsely-toothed, purplish. Stems deep purple, erect, 2ft. to 2½ft. high, glabrous. Portugal. A really noble plant, of robust habit.

S. m. pachyphyllum (thick-leaved). *fl.* greenish-yellow; cymes globose, long-stalked, forming a loose, terminal panicle. *l.* opposite, spreading, cordate-ovate, serrulated. Stems reddish.

S. m. præruptorum (overhanging). *fl.* greenish; cymes globose, on long stalks. *l.* recurved, finely toothed. Stems green.

S. m. recurvum (recurved). *fl.* greenish-yellow; cymes in a loose, terminal panicle. *l.* opposite, oblong-ovate, irregularly toothed, recurved. Stems green.

S. m. rigidum (rigid). *fl.* greenish; inflorescence loosely corymbose. *l.*, cauline ones opposite, sessile, ovate-oblong, obtuse, slightly and irregularly sinuate-toothed. Stems deep red, 2ft. to 3ft. high.

S. m. Rodigasi (Rodigas'). A form having purplish leaves, variegated with yellow. In cultivation, it is more tender than most of the varieties of *S. maximum.* (F. d. S. 1669.)

S. m. serotinum (late). *fl.* greenish-yellow; inflorescence loosely panicled. *l.* opposite, the upper ones ternate, spreading, ovate-oblong, sinuate-toothed, green. Stems green, weak.

S. m. ternatum (ternate). *fl.* yellowish; inflorescence corymbose. *l.* reddish above, dark green below, in whorls of three. Stems red.

S. m. triphyllum (three-leaved). *fl.* in terminal corymbs. *l.* ternately whorled, oblong, serrated.

S. Middendorffianum (Middendorff's). *fl.* yellow, numerous, in a flat-topped, umbellate cyme; petals spreading, ⅜in. longer than the sepals; primary branches four, with a central flower in the forks. Summer. *l.* alternate, rather fleshy, sessile, 1in. to 2in. long, erecto-patent, oblanceolate, toothed towards the apex, somewhat concave below. Amur, 1880. The variety *minor* is dwarfer in all its parts.

S. monregalense (Monregalensis). *fl.* white, ¼in. across, five-parted; sepals pink-spotted, one-third the length of the petals; petals pinkish-brown and pubescent beneath; cyme loose, terminal, many-flowered, panicled, glandular-pubescent. Summer. *l.* on barren shoots crowded, spreading, thick, ⅛in. to ¼in. long; those on fertile shoots scattered, narrower, often spotted with pink. Barren shoots spreading, erect, or creeping, 1in. to 4in. long, rooting at the nodes. North Italy. A pretty, dwarf, glabrous (except the inflorescence) evergreen.

S. montanum (mountain-loving). A mere catalogue name, under which no plant has been botanically described.

S. multiceps (many-stemmed). *fl.* pale yellow, ½in. across, five-parted; sepals linear-oblong, obtuse, half the length of the oblong-lanceolate, spreading petals; cymes sub-scorpioid, many-branched, two to six-flowered; flower-stems erect, twice the length of the barren ones. Summer. *l.* ⅛in. to ¼in. long, glaucous or pruinose, pinkish and papillose, linear and oblanceolate, sub-terete, gibbous at base, spreading on the barren, appressed on the fertile, stems. Branches 2in. to 6in. long, flexuous or erect, giving off adventitious roots, and bearing at the ends dense rosettes of leaves. Algeria. Plant sub-shrubby, much-branched, glaucous, evergreen. (G. C. n. s., x. p. 120.)

S. neglectum (neglected), of gardens. A synonym of *S. album.*

S. Nevii (Dr. Nevius'). *fl.* white, numerous, ½in. across; sepals half the length of the lanceolate petals; cymes forked, the branches 1½in. long, recurved, with a few leafy bracts; flowering stems erect, 2in. to 3in. high. July. *l.* on barren shoots crowded in terminal rosettes, each ⅝in. by ⅜in., obovate-spathulate, tapering into a short stalk, auricled at base, pink-dotted; those on the fertile stems appressed, scattered, smaller than the others. Stems prostrate. North America. Evergreen.

S. nicæense (Nice). *fl.* greenish-yellow, ½in. in diameter, five or six-parted; petals boat-shaped, twice the length of the sepals; cymes many-flowered, terminal, umbellate; flowering stems erect, 10in. to 12in. high. Late summer and autumn. *l.* of the barren shoots ½in. to ⅜in. long, less than ⅛in. wide, ascending or spreading; those of the flowering shoots appressed, lanceolate, distinctly auricled. Stems 6in. to 8in. long, at first prostrate, afterwards ascending; rootstock thick, woody. Mediterranean region. Evergreen. (A. F. P. iii. 90.)

S. obtusatum (obtuse). *fl.* yellow, ¼in. across, shortly pedicellate; petals lanceolate, more than double the length of the oblong, acute sepals; cymes terminal, spreading, umbellate, 1½in. to 2in. in diameter; flower-stems erect, terete, reddish, ultimately leafless, but scarred. June and July. *l.* rosulate, 1in. by ⅜in., spathulate, entire, glaucous, becoming reddish-green. Stems prostrate, glaucous, pruinose. California. Evergreen.

FIG. 465. SEDUM OPPOSITIFOLIUM.

S. oppositifolium (opposite-leaved). *fl.* whitish, resembling those of *S. stoloniferum*; fertile stems 6in. high, erect. August. *l.* opposite, decussate, 1½in. by 1¼in., sub-orbicular or rhomboid, tapering to short-channelled stalks, bright green, crenate-ciliate at the edges; younger ones crowded at the ends of the branches. Stems rough with minute asperities. Caucasus. Trailing evergreen. See Fig. 465. (B. M. 1807.)

S. populifolium (Poplar-leaved). *fl.* whitish or pinkish, numerous, nearly ½in. across, with the fragrance of Hawthorn; petals three times longer than the sepals; cymes terminal, much-branched, corymbose. August. *l.* alternate, 1½in. by 1in., stalked, ovate, acute, sub-cordate, coarsely and irregularly toothed. Stems erect, 6in. to 10in. high, greenish or purplish, slender, branched. Siberia, 1780. Plant glabrous, suffrutescent, evergreen. Though quite hardy, it forms a charming greenhouse subject.

S. pruinatum (pruinose). *fl.* bright yellow, ½in. in diameter, four to eight-parted; sepals acute, half as long as the obtuse, concave petals; cyme at first recurved, umbellate, many-branched, flat-topped; flower-stems erect, 1ft. high. Late summer. *l.* in many rows, sessile, crowded, spreading, slightly incurved at the ends of the sterile shoots, glaucous-blue, often tipped with rose-pink, about ¾in. long, linear-oblanceolate, aristate; those of the flowering shoots larger and less crowded. Branches 6in. to 8in. long, trailing, ascending. Europe (Britain). Plant glaucous, pruinose, evergreen. SYN. *S. elegans* (Sy. En. B. 806).

S. p. Forsterianum (Forster's). *l.* on the barren shoots many-ranked, forming terminal rosettes, spreading, pale green, oblanceolate, mucronulate, gibbous at base. Plant glabrous or slightly glaucous. SYN. *S. rupestre Forsterianum.*

S. p. minus (lesser). *l.* oblanceolate, mucronate, in rosettes. Plant glaucous, smaller in all its parts than the type. SYN. *S. rupestre minus.*

S. pulchellum (pretty).* *fl.* rosy-purple, ½in. across; petals lanceolate, acuminate, half as long again as the linear-oblong sepals; cyme three or four-branched, with erect flowers crowded in two rows along the upper surface, and each provided with a leafy bract. Branches slender, trailing, or ascending, 3in. to 6in. long. United States, 1874. A very handsome, but little-known, evergreen species. (B. M. 6223; G. C. 1878, 114.)

S. quadrifidum (four-cleft). *fl.* red, in terminal cymes; sepals oblong; petals linear-oblong, twice as long as the sepals. July. *l.* glabrous or puberulous, approximate, sub-terete, ½in. long. Stem thick, giving off numerous erect, slender stems, 2in. to 5in. high. Arctic Russia, &c., 1809.

S. reflexum (reflexed).* *fl.* yellow, ⅜in. across, four to eight-parted; sepals half as long as the linear petals; cymes umbellate, leafy, many-flowered, many-branched, with a flower in each fork; flower-stems erect, 8in. to 10in. high. Summer. *l.* in six or seven rows, crowded on the barren stems into a conical mass, ½in. to ⅜in. long, linear-subulate, terete, gibbous at base, spreading or abruptly decurved. Stems trailing. Europe (Britain). Plant glabrous, scarcely glaucous, evergreen. SYNS. *S. collinum* and *S. virens* (of gardens). The following varieties are enumerated by Dr. Masters:

S. r. albescens (whitish). *fl.* yellowish-white, ½in. across, often six-parted; sepals acute. *l.* rarely in rosettes. Plant glaucous.

S. r. cristatum (crested). This resembles the type; but the stems are fasciated so as to form a crest, as that of the Cocks-comb.

S. r. minus (lesser). The smallest variety of all.

S. r. septangulare (seven-angled). *l.* scarcely glaucous, usually somewhat thicker than in *albescens*, and arranged in seven distinct rows, often spirally wound round the stem.

Sedum—*continued.*

S. r. virescens (greenish). This only differs from *albescens* in having pale sulphur-yellow flowers.

S. retusum (retuse-leaved). *fl.* white, with a rosy centre, $\frac{1}{2}$in. to $\frac{3}{4}$in. in diameter, arranged in small, dense, terminal clusters. June. *l.* green, shining, obovate-oblong, retuse, $\frac{1}{2}$in. to $\frac{3}{4}$in. long. Branches grey, mealy when young, leafy only at the tips. Mexico, 1880. Greenhouse.

S. rhodanthum (rose-flowered). *fl.* rose-coloured, numerous, in a dense, terminal cyme 4in. to 5in. long, mostly four-parted; sepals linear; petals lanceolate, acuminate, twice as long as the sepals. End of June. *l.* alternate, lanceolate, entire, channelled, 1in. to 2in. long. Stems tufted, 1ft. to $1\frac{1}{2}$ft. high, erect. Rocky Mountains of Utah and Colorado.

S. Rhodiola (Rhodiola).* *fl.* greenish or reddish-purple, in a terminal, flat-topped, sub-globose cyme, about 1in. in diameter; petals four; pedicels short. Summer. *l.* scattered, glaucous, spreading or erect, 1in. by $\frac{1}{2}$in., sessile, oblong, obtuse, rounded at base, obscurely one-nerved, slightly toothed at apex. Stems annual, several from the same stock, 6in. to 8in. high, erect, unbranched. Europe (Britain), &c. The roots exhale a perfume of rose-water. (Sy. En. B. 525.) SYN. *Rhodiola rosea. linifolia* (R. G. 1080) is a Turkestan form, with narrow leaves and brightly-coloured flowers. *minor* is a small form.

S. rupestre (rock-loving). *fl.* clear yellow, numerous, barely $\frac{1}{2}$in. in diameter, five to seven-parted; sepals ovate-oblong, obtuse; petals similar, concave, not keeled; cymes umbellate, three to five-forked, ultimately hollow-topped; stalks 8in. to 12in. long. July. *l.* $\frac{1}{2}$in. long, in very numerous rows, linear-subulate, incurved, convex below, flattish above, forming dense, obconical rosettes $\frac{3}{4}$in. to 1in. in diameter, at the ends of the sterile branches. Western Europe (Britain). Plant glaucous, evergreen, but reddening with age and drought.

S. r. Forsterianum (Forster's). A synonym of *S. pruinatum Forsterianum.*

S. r. minus (lesser). A synonym of *S. pruinatum minus.*

S. sarmentosum (sarmentose).* *fl.* bright yellow, numerous, $\frac{1}{2}$in. in diameter; sepals fleshy, half the length of the lanceolate petals; inflorescence a flat-topped, umbellate, three to five-forked cyme, with a solitary flower in the forks. *l.* crowded, opposite, or whorled, $\frac{1}{2}$in. to $\frac{3}{4}$in. long, linear, terete or slightly flattened, apiculate, slightly gibbous at base; those of the flower-stem scattered, ascending. China. Greenhouse evergreen. There is a variety of this with pink stems, and having leaves marked with a marginal stripe of white or cream-colour; it is grown in greenhouses and for carpet beds under the name of *S. carneum variegatum.*

S. Selskyanum (Selsky's). *fl.* yellow, numerous in a many-branched, hollow-topped, leafy cyme, the rachis flexuous; corolla nearly 1in. across, half as long again as the calyx. Late summer. *l.* sessile, ascending; upper ones $1\frac{1}{2}$in. long, less than $\frac{1}{2}$in. broad, lanceolate from a broad base, ciliated; midrib very prominent on the under surface; margin serrated in its distal third. Stems 1ft. to $1\frac{1}{2}$ft. high, erect, pilose. Amur and Manchuria.

S. Selskyanum (Selsky's), of gardens. A synonym of *S. kamtschaticum.*

S. Semenovii (Semenow's). *fl.* whitish, $\frac{1}{2}$in. or more in diameter, in compact, terminal, globose cymes; sepals reddish, longer than the tube; petals tipped with pink. June. *l.* in six rows, erecto-patent, sessile, about 1in. long, linear, acute, entire, one-nerved, channelled above. Stems annual, from a many-headed rhizome, erect, cylindrical, glabrous, about 1ft. high. Turkestan.

S. sempervivoides (Sempervivum-like).* *fl.* bright red; sepals deltoid, acute, pilose; petals $\frac{1}{4}$in. long, lanceolate, acute; cyme many-flowered, panicled, 2in. to 4in. in diameter; peduncle pilose. July. *l.* of the rosette forty to fifty, obovate-cuneate, 1in. by $\frac{3}{4}$in.; those of the flower-stem clasping, greenish-red, oblong, acute. *h.* 4in. to 8in. Asia Minor. A remarkably handsome, pubescent, annual or biennial species.

S. sexangulare (six-angled). *fl.* yellow, $\frac{1}{3}$in. across; petals lanceolate, double the length of the linear-oblong sepals; cyme three to five-branched, umbellate, 1in. to 3in. across, with scorpioid, one-sided branches; flower-stems erect, 2in. to 3in. high, very slender. July. *l.* densely crowded in six or seven rows, spreading or ascending, about $\frac{1}{4}$in. long, linear-cylindric. Barren shoots ascending, 2in. to 3in. long, branched. Europe (Britain). (Sy. En. B. 533.) Plant glabrous, evergreen. A neat-habited species.

S. Sieboldi (Siebold's).* *fl.* pinkish, numerous, $\frac{1}{2}$in. across; petals having a green spot on the back near the top, three times as long as the sepals; cymes much-branched, umbellate; pedicels longer than the flowers. August. *l.* in whorls of three, sessile or nearly so, spreading, sub-orbicular, sinuate, cuneate at base, bluish-green, pinkish on the margins. Branches terete, slender, purplish, erect, afterwards recurved. *h.* 9in. Japan, 1836. Greenhouse or half-hardy evergreen. (B. M. 5358.)

S. S. medio-variegatus (variegated-centred). This differs from the type in having a central blotch of creamy-white on each leaf. (I. H. 373.)

S. spathulifolium (spathulate-leaved). *fl.* yellow, numerous, $\frac{1}{2}$in. across; sepals half the length of the acuminate, keeled petals; cymes terminal, forked, the branches 3in. long. May and June. *l.*, upper ones on the barren shoots about fifteen in a terminal rosette, $1\frac{1}{2}$in. in diameter; lower ones and those of the flower-stem scattered, spreading, $\frac{1}{2}$in. by $\frac{2}{3}$in.; those of the flower-stem club-shaped. Branches creeping or ascending, 3in. to 4in. long. North-west America, 1873. Evergreen. (G. C. n. s., v. 146; R. G. 741.)

S. spectabile (remarkable).* *fl.* pink, numerous, $\frac{1}{2}$in. across; sepals whitish; petals twice the length of the sepals, slightly concave; cymes large, flat-topped, inversely pyramidal, leafy, umbellate. September. *l.* opposite, decussate, or in horizontally-spreading whorls of three, 3in. by 2in., flat, scarcely petiolate or the upper ones quite sessile, ovate, obtuse, or spathulate, entire or obscurely toothed, slightly cuneate at base. Stem $1\frac{1}{2}$ft. to 2ft. high. Probably Japan. A robust and noble species. (Ref. B. 32; R. G. 709; I. H. viii. 271, under name of *S. Fabaria.*)

S. spurium (spurious). A synonym of *S. stoloniferum.*

S. stenopetalum (narrow-petaled). *fl.* bright yellow, five-parted; petals linear-lanceolate, acuminate, twice longer than the awl-shaped sepals; cymes much-branched, scorpioid. *l.* numerous, crowded on the barren shoots, sessile, fleshy, lanceolate, $\frac{1}{2}$in. long. Stems 3in. to 6in. long, erect from a decumbent base, simple or somewhat branched. Rocky Mountains, 1877. Plant glabrous, evergreen.

S. stoloniferum (stolon-bearing). *fl.* pink or white, numerous, $\frac{3}{4}$in. in diameter; petals nearly twice the length of the sepals; cymes terminal, umbellate, 2in. in diameter; ultimate pedicels shorter than the flowers; flower-stems 6in. long, ascending, reddish. July and August. *l.* opposite, $\frac{3}{4}$in. to $1\frac{1}{4}$in. long, cuneate-spathulate, coarsely toothed above the middle, tapering into short stalks, the margins studded with hyaline papillæ. Barren stems trailing, sometimes brown-dotted, rooting at the nodes. Caucasus. Evergreen. SYNS. *S. dentatum* and *S. denticulatum* (of gardens), *S. spurium* (B. M. 2370). *S. ibericum* (of gardens) is a small, slender form, with white flowers and ciliolate leaves.

S. telephioides (Telephium-like). *fl.* small, numerous; petals falcate, hooded at the tip; cymes small, dense, 1in. to $1\frac{1}{2}$in. in diameter. June. *l.* scattered, 2in. by 1in., oblong-obovate, obtuse, nearly entire or sparingly toothed, cuneate at base. Stem 6in. to 12in. high. North America, 1810. Plant glabrous.

S. Telephium (Telephium). *fl.* pink, white-spotted, or sometimes pure white, numerous, in dense, terminal or lateral, sub-globose, stalked cymes; calyx tube very short, the sepals lanceolate; petals spreading, somewhat recurved; peduncles short and nearly equal. August and September. *l.* scattered, rarely opposite, ascending or spreading, 2in. to 3in. long, 1in. to $1\frac{1}{4}$in. broad, oblong-ovate, obtuse, toothed; lower ones cuneate at base; upper ones somewhat rounded. Stem erect, 1ft. to $1\frac{1}{2}$ft. high. Europe (Britain). *S. T. Fabaria* is a sub-species, having flowers smaller, appearing earlier; petals less recurved; peduncles short, arranged in a terminal cyme. Leaves narrower than in the type, the lower ones slightly stalked. To *S. Telephium* and its sub-species may be referred a large number of more or less constant forms, of which the following are described by Dr. Masters:

S. T. affine (related). *fl.* pink, $\frac{2}{3}$in. across; sepals one-third the length of the spreading petals; cymes terminal, loosely fastigiate. August. *l.* alternate, sessile, 2in. by 1in., ovate-oblong, acute irregularly toothed above. Stem 1ft. to $1\frac{1}{2}$ft. high, greenish or red-spotted.

S. T. arduennense (Ardennes). *fl.* whitish, $\frac{2}{3}$in. across; sepals deltoid, one-third the length of the erecto-patent petals; cymes numerous, forming a loose, terminal panicle. August. *l.*, cauline ones alternate, appressed, nearly $4\frac{1}{2}$in. by $2\frac{1}{2}$in., ovate-oblong, obtuse. Stems purplish, 8in. to 12in. high.

S. T. Borderi (Border's). *fl.* pink; cymes corymbose, flat-topped. *l.* distinctly stalked, oblong, obtuse, tapering to the base, irregularly and coarsely toothed. Stems reddish.

S. T. Brunfelsii (Brunfels'). *fl.* pink, $\frac{2}{3}$in. across; sepals one-third the length of the spreading, oblong-lanceolate petals; cymes terminal, rounded. August. *l.* glaucous, appressed, sessile, oblong-obovate, 3in. by $\frac{3}{4}$in., irregularly toothed, reddish along the midrib. Stem 6in. to 18in. high.

S. T. Jullianum. *fl.* greenish, ultimately pinkish, $\frac{1}{2}$in. across; sepals one-third the length of the lanceolate petals; cymes terminal and lateral, compact, forming a large, terminal panicle. August. *l.* alternate, appressed, 3in. by $1\frac{1}{2}$in., obovate, irregularly toothed in the upper half. Stems 1ft. to $1\frac{1}{2}$ft. high, finely spotted.

S. T. lugdunensis (Lyons). *fl.* rose-pink; cymes numerous, loosely corymbose, on long stalks. *l.* in whorls of three, spreading or ascending, rounded at base, coarsely toothed. Stems stout.

S. T. occidentale (Western). *fl.* pinkish, $\frac{2}{3}$in. across; sepals deltoid-linear; petals spreading, lanceolate; cymes numerous, many-flowered, leafy. August and September. *l.* alternate, ascending, 3in. by $1\frac{1}{4}$in., obovate-oblong, obtuse, tapering to the base, toothed in the upper two-thirds; upper ones sub-cordate. Stems reddish, robust.

S. T. pycnantha (dense-flowered). *fl.* greenish; cymes globose, the lower ones on long stalks; inflorescence compact, many-

Sedum—*continued.*

cymed. *l.* alternate, ascending, tapering at both ends. Stem green.

S. T. rhodanensis (Rhone). *fl.* pink; cymes corymbose, globose, long-stalked. *l.* alternate, spreading, tapering to the base and apex, coarsely toothed.

S. T. rubella (reddish). *fl.* pink; cymes globose, the lower ones on long, horizontal stalks, forming an elongated, oblong panicle. *l.* red, tapering to the base, narrow-oblong, coarsely toothed. Stems red.

S. T. thyrsoideum (thyrsoid). *fl.* greenish or yellowish, ⅛in. in diameter; cymes numerous, globose, many-flowered, on long, ascending stalks, forming a large, compact panicle. August and September. *l.* opposite or whorled; lower ones ascending, 3in. by 1in., oblong, acute, toothed in the upper two-thirds; upper ones smaller, sub-cordate. Stems about 2ft. high, reddish.

The following other forms of *S. Telephium* have been mentioned: *albicans, Bulliardi, Carioni, controversum, corymbiferum, grandidentatum, intermedium,* and *Lobellii.*

S. ternatum (ternate). *fl.* white, ½in. across, four-parted; sepals oblong, obtuse; petals oblong, acute, twice the length of the sepals; flower-stems erect. July and August. *l.* ½in. long, in whorls of three, sub-orbicular-spathulate, crowded into rosettes at the ends of the barren stems; those of the fertile stems scattered, ascending or spreading, oblong, acute. Barren stems 6in. to 8in. long, prostrate. North America, 1789. A glabrous or glaucous evergreen. (B. M. 1977; B. R. 142.)

S. trifidum (trifid). *fl.* at first reddish, in small, dense, terminal cymes; petals linear-lanceolate, twice the length of the lanceolate sepals. Summer. *l.* glabrous, aggregated towards the top of the stem, sessile, spreading, oblong, cuneate at base, coarsely toothed or pinnatifid. Stems erect, slender, 3in. to 7in. high, unbranched. Temperate Himalayas.

S. umbilicoides (Umbilicus-like). *fl.* white, seven-parted; inflorescence long-stalked, cymose. *l.* rosulate, convex, oblong-lanceolate. Alatan, Turkestan. Evergreen. (R. G. 917.)

SEED. Seeds are met with only in flowering plants, and are the result of the union of the male and female elements, for the reproduction of the species. They are the ovules, fertilised by the action of the pollen, and subsequently ripened (*see* **Ovule**); and each contains an embryo (rarely two or more), *i.e.*, a young plant, capable, when the Seed is placed in suitable conditions, of becoming, in all points, like its parents. The existence of an embryo in Seeds affords a sharp distinction between them and the *spores* of Cryptogams, which correspond with them in function, but are very often one-celled, and never contain an embryo. A reference to the account given under **Ovule** will facilitate the explanation of the changes that the ovules undergo in

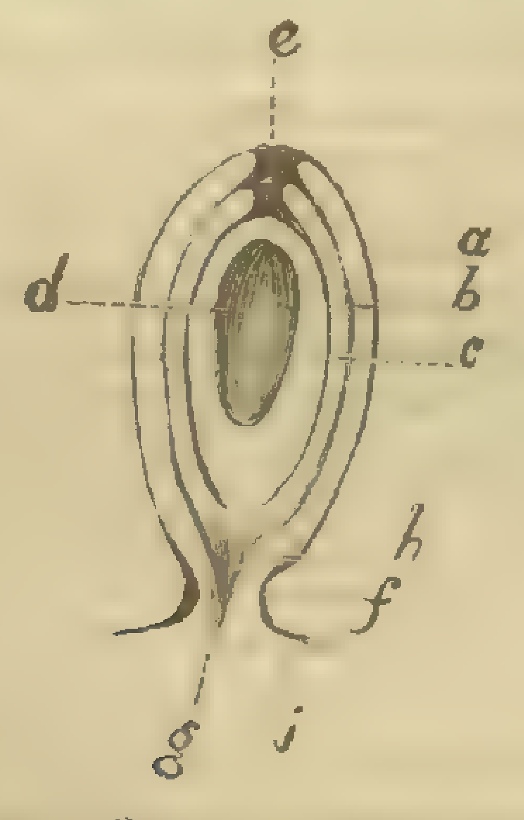

FIG. 466. ORTHOTROPOUS OVULE IN SECTION, showing two Coats (*a*, *b*), with the Micropyle (*e*), the Nucellus (*c*), and the Embryo-sac (*d*). The signification of the other letters is as follows: *f* is the Funiculus or Stalk; *g*, the Raphe, or Fibro-vascular Bundle in the Stalk; *h*, the Chalaza, where the Stalk afterwards breaks off, and leaves the Hilum or Scar; *i*, the Placenta from which the Ovule grows.

becoming Seeds. In the unfertilised ovule (see Figs. 466 and 467), there are generally two coats, surrounding a central cellular mass, called the nucellus; but there is a passage (micropyle) at the true apex of the ovule, through both coats. In the middle of the nucellus lies a large cell, the embryo-sac, formed by the union of two or more cells. Within this sac are several cells (see Fig. 468), *viz.*, at the end next the micropyle two oval or elongated cells, the "helper cells," with a round cell (two in *Santalum album*) at their inner end, called the embryonal

Seed—*continued.*

vesicle. At the opposite end of the embryo-sac are three others, called antipodal cells, which are believed to be the last traces of a prothallus, such as is formed in *Selaginella* among Vascular Cryptogams. Among the protoplasm that lines the walls of the embryo-sac as a thin layer, two nuclei may generally be distinguished. After fertilisation, *i.e.*, after the pollen tube has reached the embryonal vesicle through the micropyle, the helper

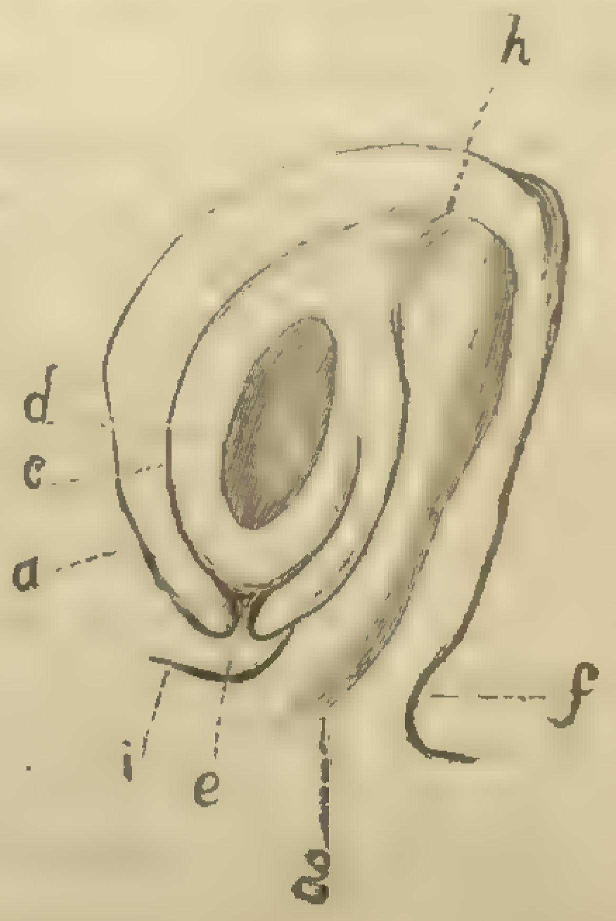

FIG. 467. ANATROPOUS OVULE OF ACTÆA SPICATA, IN SECTION Only one Coat (*a*) exists on it (other lettering as in Fig. 466).

cells and the antipodal cells disappear; the cell wall of the embryonal vesicle becomes thicker, and the cell grows, and becomes divided by cross-walls. At last it forms a cellular mass, the embryo, on the end of the suspensor, which part in most plants is a row, but in some is a mass, of cells. In the embryo of the ripe Seed, it is generally easy to make out radicle, stem, plumule, and one or two cotyledons. Thus, in it all the vegetative

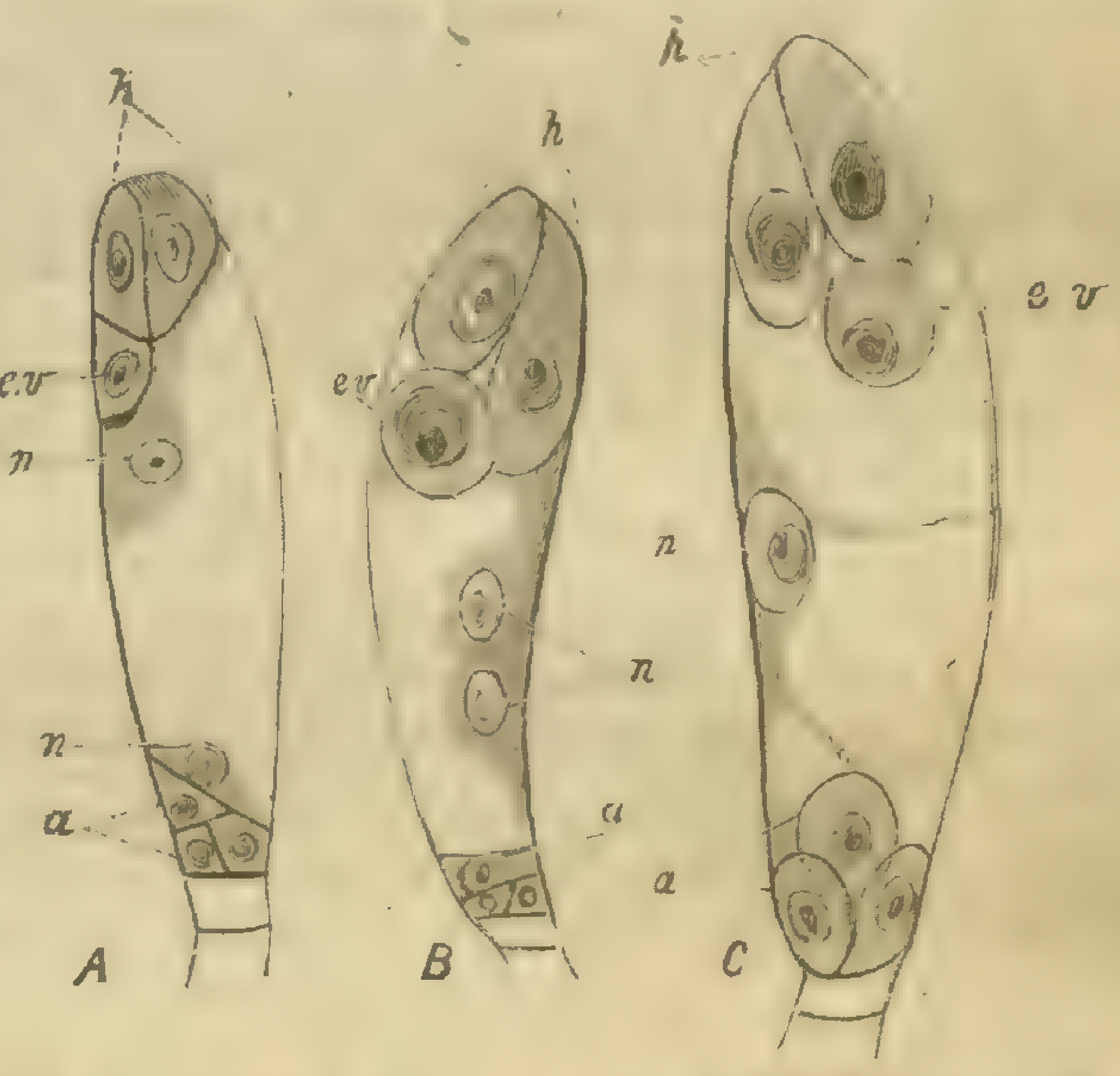

FIG. 468. EMBRYO-SAC OF ANGIOSPERM BEFORE FERTILISATION, IN THREE STAGES, showing (*h*) Helper Cells, (*e v*) Embryonal Vesicle, (*a*) Antipodal Cells, and (*n*, *n*) Nuclei. In A, the Helper and Antipodal Cells, and the Embryonal Vesicle, are still angular, and the two Nuclei are wide apart; in B, the Embryonal Vesicle is rounded, and the Nuclei lie close together; in C, the Embryonal Vesicle is ready to be fertilised, the two Nuclei are united to form one, and the Antipodal, as well as the Helper Cells are rounded off.

organs of the future plant are represented, except in a few families (*e.g.*, Orchids), in which the embryo is only a mass of cells, without distinction of parts. In *Coniferæ*, the course of development of the ovule into the Seed is different in several respects; but the result is much the same as regards the structure of the mature Seed. While the embryo is in course of development, the nuclei of the embryo-sac give rise to the endosperm. At first, this consists of cells free from one another, but soon

Seed—*continued.*

they come into contact, and, by their union, form a tissue that quite resembles those formed by ordinary cell-divisions, and that does itself increase in size in this way. The endosperm, also called the albumen, is formed in all Seeds; but in many it disappears, as it is used up in the growth of the embryo, *e.g.*, in the Seed of an Apple, or of a Bean. Such Seeds are called "exalbuminous." In many Seeds a considerable, or even a large, albumen exists in the ripe Seed, with the embryo lying in it (*Polygonum*), or around it (*Lychnis*), or at the base (*Carex*), or on one side of it (Grasses). Besides the endosperm, another form of albumen, known as "perisperm," occurs in many plants. This is formed in the tissue of the nucleus, outside the embryo-sac. Perisperm is less common than endosperm, but co-exists with the latter in the ripe Seeds of a few plants (*Nymphæa*), and occasionally replaces it (*Canna*). The albumen may contain starch, oil, cellulose, or other materials for nourishment of the young plant; and its texture varies accordingly. The presence and nature of the albumen afford important characteristics of Natural Orders. Under **Ovule,** it was pointed out that the form of the ovule might remain orthotropous, or might become campylotropous or anatropous. The ripe Seeds show corresponding differences in form.

Seeds generally possess two coats, the outer called "testa," and the inner "tegmen." The latter is usually thin and membranous. The testa is very often thick and hard, *e.g.* in Brazil Nuts. It often bears outgrowths in the form of warts or ridges, hairs (Cotton), or wings, which are sometimes of large size (*Pinus*, *Bignonia*). All these outgrowths bear reference to the modes of distribution of Seeds, fitting them to adhere to the bodies of birds or quadrupeds, or to be distributed by wind. Occasionally, the testa has an outer layer of cells, which become mucilaginous on contact with water, and cause Seeds, when moist, to adhere to the bodies of animals. On the outer surface of the testa is the hilum, or scar, indicating the point of attachment of the Seed to its stalk. Many Seeds possess what resembles a third coat when ripe. In some, this coat, the "arillus," grows up from the placenta around the Seed; in others, it grows from the micropyle downwards, and it is then distinguished as the "arillode." An outgrowth is often seen in anatropous ovules (*e.g.*, in Violets) over the funiculus (the adherent stalk); it is called a "caruncle." This third coat, whether arillus, arillode, or caruncle, in some Seeds is fleshy (*e.g.*, mace of Nutmeg), serving as an inducement to animals to swallow the Seeds, and thus to secure wide distribution in their excrements; in others, it forms a tuft of hairs, and serves as a float for the Seed. In size and form, Seeds vary greatly in different plants, from the minute, dust-like Seeds of Orchids to the large Seed of the Cocoanut. The number produced by different plants is also very variable; but into these and similiar matters it is not possible to enter here.

SEED-BEDS. A term applied to narrow strips of land prepared for the raising of seedling plants that are intended for transplanting into their permanent quarters, instead of being sown and allowed to grow there from the first. In all cases it is advisable to select a position for Seed-beds where the soil is friable and in good working order, and to render the surface smooth and fine before scattering the seeds over it. It is an easy matter to mark off any requisite width, according to the quantity of seed to be sown.

SEED-SOWING. *See* **Propagation.**

SEEMANNIA (named after Berthold Seemann, 1825-1871, a botanist and traveller). ORD. *Gesneraceæ.* A monotypic genus. The species is a strigose-pubescent, stove, perennial herb, with a creeping rhizome, closely allied to *Achimenes* and *Isoloma*. For culture, *see* **Gesnera.**

Seemannia—*continued.*

S. Benaryi (Benary's). A synonym of *S. silvatica.*

S. silvatica (sylvan). *fl.* of a bright scarlet, on solitary, axillary pedicels; calyx with an adnate tube and five narrow lobes; corolla tube shortly gibbous at base, the limb of very short, erecto-patent lobes; stamens affixed to the base of the corolla. Winter. *l.* three or four in a whorl, very shortly petiolate, often canescent beneath; upper ones gradually reduced to bracts. *h.* 3ft. to 4ft. Peru. SYNS. *S. Benaryi* (R. G. 814), *S. ternifolia* (R. G. 126).

S. ternifolia (ternate-leaved). A synonym of *S. silvatica.*

SEGMENT. One of the divisions into which a leaf or other flat organ may be cut.

SEGO. A common name for *Calochortus Nuttallii.*

SEGREGATE. Separated. The reverse of Aggregate.

SELAGINEÆ. A natural order of shrubs, undershrubs, or annual or perennial herbs, inhabiting extra-tropical regions, Australia excepted. Flowers white, blue, or rarely yellow, rather small, hermaphrodite, irregular, bracteate, ebracteolate, in dense, globose, oblong, or elongated, terminal or very rarely axillary spikes; calyx five-cleft or five-parted, or, owing to some of the parts being connate or deficient, three-parted, two-parted, or spathaceous; corolla gamopetalous, shortly or slenderly tubular at base; limb four or five-lobed, one or two-lipped, or sub-regular, spreading; stamens four, didynamous, or two. Fruit small, indehiscent. Leaves alternate, or the lower ones rarely opposite or radical, entire or toothed. The order comprises eight genera and about 140 species. Examples: *Globularia*, *Hebenstretia*, *Selago.*

SELAGINELLA (diminutive of *Selago*, the old name for another Lycopod). ORD. *Lycopodiaceæ.* A vast genus (upwards of 300 species) of stove, greenhouse, or hardy, evergreen plants, much resembling Mosses. "The genus is concentrated in the tropical zone, and has its head-quarters in tropical America. Only two species extend their range into Europe; and the Selaginellas of the Cape, temperate Australia, and South temperate America, are neither numerous nor remarkable. . . . Habit entirely of *Lycopodium*, from which it differs by its dimorphic spores and sporangia, some of the species, small and fugacious, resembling *Hepaticæ*, with not more than two vascular bundles on the main stems. Stems copiously branched, the ultimate branching usually flabellate-dichotomous, trailing, sub-erect, sarmentose, or scandent, with the root-fibres confined to the base, or in the trailing species extended to the upper nodes; in shape more or less distinctly quadrangular, the faces angled (stems goniotropous, Spring) or the faces flat (stems pleurotropous, Spring); nodes sometimes distinctly articulated. Leaves small, furnished only with a single central vein, usually tetrastichous and dimorphous, and more or less oblique, the two rows of the lower plane larger and more spreading, the two rows of the upper ascending, adpressed to the stem and imbricated; in the sub-genus *Euselaginella* multifarious, or, if tetrastichous, all alike. Spikes usually tetrastichous and often sharply square, but in two sub-genera dimorphic on the same plan as the leaves, but mostly resupinate (*i.e.*, the small bracts on the same plane as the large leaves, and *vice versâ*)" (J. G. Baker, to whose admirable monograph of *Selaginella*, in the "Journal of Botany," 1883-5, we are indebted for the appended descriptions of the species best known to cultivation in this country). Selaginellas grow freely in any light soil, which should be kept open by intermixing charcoal, or small potsherds, through it. They require to be kept quite moist at all times, and prefer shade. Propagated readily from cuttings, made from the creeping stems, which emit roots at nearly every joint. *S. Kraussiana* is the well-known Lycopod so useful for edgings to greenhouse beds, and for decorative purposes in pots. This may be propagated in quantity at any season. Cuttings for preserving a collection of the

Selaginella—*continued.*

species should be inserted, about February or March, in the pots or pans in which they are to remain for the season. Both stove and greenhouse Selaginellas succeed under somewhat similar conditions respectively to stove and greenhouse Ferns.

S. affinis (related). *stems* 1ft. or more long, trailing, flat on the back, bisulcate on the face, jointed at the nodes, forked low down and copiously pinnate, with erecto-patent, copiously compound branches. *l.* of the lower plane obtuse on the branchlets, ascending, oblong-lanceolate, acute, ⅛in. to ⅙in. long, bright green; leaves of the upper plane one-third as long, oblique-oblong, cuspidate, imbricated. *spikes* ¼in. to ½in. long; bracts ovate, cuspidate, strongly keeled. Guiana. A rare, stove species. SYN. *S. rigida* (of gardens).

S. africana (African). A synonym of *S. Vogelii*.

S. albo-nitens (shining-white).* *stems* slender, trailing, copiously pinnate, the upper branchess imple, the lower slightly compound. *l.* of the lower plane spaced on the main stem, spreading, oblong-lanceolate, one line long, bright green, rather unequal-sided, rounded on the upper side at the base, shortly ciliated; leaves of the upper plane one-third as long, oblique-ovate, distinctly cuspidate. *spikes* ¼in. to ½in. long; bracts acute, very crowded, strongly keeled. West Indies. Greenhouse.

S. amœna (pleasing). A variety of *S. caulescens*.

S. apoda (footless). A garden name for *S. apus*.

S. apus (footless).* *stems* slender, trailing, densely matted, 1in. to 4in. long, the short, distant, erecto-patent branches simple or forked. *l.* of the lower plane spaced below the tips of the branches, the upper spreading, the lower reflexed, ovate, acute, half a line long, unequal-sided; leaves of the upper plane half as long, shortly cuspidate. *spikes* ¼in. to ½in. long; bracts ovate, acute, about one line long, strongly serrulated. Canada, &c. Greenhouse. SYNS. *S. apoda* and *S. densa* (of gardens).

S. argentea (silvery), of Spring. A variety of *S. caulescens*. The name *argentea* is also used in trade catalogues for *S. erythropus*.

S. ascendens (ascending). A form of *S. Martensii*.

S. atroviridis (dark green).* *stems* sub-erect, 6in. to 12in. long, flat on the back, the root-fibres confined to the lower part, decompound, the branching between pinnatifid and pinnate. *l.* of the lower plane close, both on the stem and branches, spreading or rather ascending, oblong-rhomboid, sub-obtuse, ⅙in. to ⅛in. long, bright green, unequal-sided, obscurely or distinctly ciliated; leaves of the upper plane half as long, long-cuspidate, much imbricated. *spikes* square, ½in. to 1in. long; bracts ovate, acute, strongly keeled. Madras, &c. Stove.

S. azorica (Azores). *stems* trailing, rooting nearly to the tip, 2in. to 3in. long, with several short, compound branches. *l.* of the lower plane contiguous on the branches, oblique-oblong, nearly equilateral, acute, ⅛in. long, rounded at the base, serrulated from base to apex along both branches, bright green; leaves of the upper plane much imbricated, more than half as long as the others, oblique, oblong-lanceolate. Azores. Greenhouse.

S. bellula (rather pretty), of Moore. A synonym of *S. inæqualifolia perelegans*.

S. brasiliensis (Brazilian). *stems* trailing, 2in. to 4in. long, copiously pinnate, the branches erecto-patent, the upper simple, the lower slightly decompound. *l.* of the lower plane spaced and spreading, except towards the tips of the branches, nearly or quite one line long, bright green, cordate at base on the upper side, distinctly ciliated and imbricated over the stem; leaves of the upper plane half as long, distinctly cuspidate. *spikes* ¼in. to ½in. long; bracts ovate-lanceolate, strongly keeled. Brazil. Greenhouse. A near ally of *S. apus*.

S. Braunii (Braun's). *stems* 1ft. to 1½ft. long, erect, pale straw-colour, simple in the lower half, decompound, deltoid, and flexuous in the upper half; pinnæ erecto-patent, deltoid; pinnules regular, short, deltoid, spaced; ultimate branchlets ⅛in. to ¼in. long. *l.* of the lower plane contiguous only on the final branchlets, nearly spreading, ovate-rhomboid, half a line long; leaves of the upper plane one-third to half as long, shortly cuspidate. *spikes* short, square; bracts little longer than the sporangia. West China. A distinctly-marked and well-known, greenhouse species.

S. Brownii (Brown's). A form of *S. Kraussiana*.

S. cæsia (grey). A garden synonym of *S. uncinata*.

S. c. arborea (tree-like). A synonym of *S. Willdenovii*.

S. canaliculata (channelled).* *stems* sub-erect, sarmentose, 3ft. to 4ft. long; pinnæ deltoid, usually 4in. to 6in. long, sometimes flexuous and more elongated; lower branchlets copiously compound, the tertiary divisions more erecto-patent, and not so close as in *S. inæqualifolia*. *l.* of the lower plane crowded, oblong-rhomboid, $\frac{1}{12}$in. to ⅛in. long on the branchlets, bright green, cuneate-truncate on the upper, nearly square on the lower, side at the base; leaves of the upper plane half as long, ovate-lanceolate. *spikes* square, ½in. to 1in. long; bracts cuspidate, strongly keeled. Eastern Himalayas, &c. Stove. Rare in cultivation. SYNS. *S. caudata*, *S. chinensis*, *S. sinensis* (of gardens).

Selaginella—*continued.*

S. c. robusta (robust). A very tall, strong-growing garden form SYN. *S. robusta* (of gardens).

S. caudata (tailed). A synonym of *S. canaliculata*.

S. caulescens (stemmed).* *stems* generally 6in. to 12in. long, stiffly erect, unbranched in the lower half, with spaced, adpressed leaves, deltoid and decompound in the upper half; pinnæ close, deltoid, with copiously sub-flabellately compound lower pinnules, the final branchlets ascending. *l.* of the lower plane crowded, ovate, falcate, acute, half a line to one line long, bright green, slightly ciliated on the upper side at base; leaves of the upper plane a quarter to one-third as long, much imbricated. *spikes* square, ⅙in. to ½in. long; bracts ovate, cuspidate. Japan, China, &c. Stove.

S. c. amœna (pleasing). *stems* erect, about 1ft. high; upper part triangular, pinnately branched, with spreading, distant, acuminate leaves; branches horizontal, bipinnate. Mexico. Whole plant of a bright and cheerful green.

S. c. argentea (silvery). This only differs from the type in the silvery sheen of its under surface. SYN. *S. argentea* (of gardens).

S. c. japonica (Japanese). *stems*, pinnæ less crowded, and not so decompound as in the type. *l.* of the lower plane broadly ovate; those of the main stem and pinnæ nearly as broad as long; those of the unbranched part of the stem rather spreading. Japan.

S. chinensis (Chinese). A garden name for *S. canaliculata*.

S. cognata (related). A synonym of *S. Lobbii*.

S. conferta (clustered). *stems* very slender, trailing, intermatted, 1in. to 2in. long, copiously pinnate, the lower branches slightly compound. *l.* of the lower plane close, erecto-patent, linear-oblong, obtuse, half a line long, equal-sided, strongly ciliated, a little imbricated; leaves of the upper plane one-third or one-fourth as long, acute. *spikes* very short; bracts ovate, crowded, strongly keeled. Cuba. Stove.

S. convoluta (convolute). *stems* densely tufted, 3in. to 6in. long, compound nearly to the base, the primary branching pinnate, the short, broad, erecto-patent pinnæ between pinnate and flabellate. *l.* of the lower plane much imbricated, ascending, ovate, acute, half a line long, serrulated, bright green; leaves of the upper plane half as long, acute. *spikes* square, ¼in. to ½in. long; bracts cuspidate, strongly keeled. Tropical America. Stove.

S. cuspidata (cuspidate).* *stems* densely tufted, about 6in. long, branched nearly or quite from the base, the primary branching pinnate; pinnæ short, rhomboid, copiously compound, with contiguous branchlets. *l.* of the lower plane crowded, ascending, oblique-ovate, cuspidate, dilated and ciliated on the upper side at base, pale green, white-edged, half a line to one line long; leaves of the upper plane nearly as long, cuspidate. *spikes* square, ¼in. to ½in. long; bracts cuspidate, strongly keeled. Mexico, &c. A common, stove species.

S. c. elongata (elongated). *stems* 1ft. or more long, simple in the lower part, the primary branches more elongated and more pinnate. SYN. *Lycopodium cordifolium* (of gardens).

S. delicatissima (very delicate). *stems* densely matted, very slender, stramineous, trailing to a length of 6in. to 12in., forked and copiously pinnately branched, the branches copiously compound. *l.* of the lower plane spaced, except at the tips of the branches, spreading, oblong, obtuse, broadly rounded and densely ciliated on the upper side at base; leaves of the upper plane half as long, acute, strongly auricled on the outside at base. *spikes* unknown. Probably Andine. Greenhouse. The leaves and branches curl up readily in drought.

S. densa (dense). A garden name for *S. apus*.

S. denticulata (small-toothed).* *stems* densely matted, pale, trailing, 6in. long, copiously pinnately branched, the lower branches copiously flabellately compound. *l.* of the lower plane close or slightly spaced, broadly ovate, oblique, sub-acute, three-quarters of a line to one line long, spreading or erecto-patent, flat, denticulate, cordate on the upper side at base, much imbricated over the stem; leaves of the upper plane half as long, cuspidate, rather diverging. *spikes* sessile, square, about ⅛in. long; bracts acute, much imbricated, strongly keeled. Mediterranean region. Greenhouse. In exposed places, the whole plant sometimes turns bright red when old.

S. dichrous (two-coloured). A garden form of *S. Vogelii*.

S. distorta (distorted). *stems* slender, trailing or sub-erect, intermatted, 3in. to 6in. long, obscurely jointed at the nodes, copiously pinnate, the short, ascending branches sub-flabellately compound. *l.* of the lower plane crowded on the branchlets, deflexed, oblong-lanceolate, acute, about half a line long; leaves of the upper plane more than half as long, imbricated, oblong, acute. *spikes* short, square; bracts acute, strongly keeled. Brazil. Greenhouse.

S. d. major (larger). More luxuriant, with stouter stems, 1ft. or more in length, and often excurrent at the end; leaves of the lower plane often one line long, spreading, or rather ascending.

S. divaricata (divaricate). A form of *S. Martensii*.

Selaginella—*continued.*

S. erythropus (red-footed).* *stems* about 9in. long, bright crimson, simple in the lower half or third, deltoid and decompound upwards; lower pinnæ deltoid, tripinnate; final branchlets ascending, contiguous. *l.* of the lower plane contiguous, ascending, oblong or ovate-lanceolate, acute, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, bright green, unequal-sided, strongly ciliated and imbricated over the stem on the upper side at the base; leaves of the upper plane half as long, oblique-ovate, cuspidate. *spikes* square; bracts cuspidate, strongly keeled. Tropical America. Stove. The form *major* is more compound, the unbranched part of the stem longer, and all its leaves adpressed. *S. setosa* (of gardens) is a starved, small form of this species.

S. filicina (Fern-like). A synonym of *S. hæmatodes.*

S. flabellata (fan-shaped). *stems* 1ft. to 2ft. long, erect, simple in the lower half, deltoid and decompound in the upper half; pinnæ deltoid, the lower three or four-pinnate; final branchlets contiguous, $\frac{1}{4}$in. to 1in. long. *l.* of the lower plane contiguous, oblique-ovate, acute, ascending, bright green, obliquely inserted, much dilated, ciliated, much imbricated over the stem on the upper side at base; leaves of the upper plane a quarter to one-third as long, cuspidate. *spikes* square, $\frac{1}{8}$in. to 1in. long; bracts cuspidate, strongly keeled. Tropics of Asia, America, and Polynesia. Stove.

S. flagellata (whip-like). *stems* trailing, 6in. long; branches erecto-patent, the lower ones copiously compound; branches excurrent and whip-like at the end. *l.* of the lower plane ovate-lanceolate, very acute, above one line long, pellucid, bright green, more produced on the upper side of the midrib, rounded at the base, shortly ciliated, imbricated over the stem; leaves of the upper plane one-third as long, ovate, acuminate, falcate, converging. *spikes* $\frac{1}{8}$in. to $\frac{1}{4}$in. long; bracts very acuminate, strongly keeled. French Guiana. Stove.

S. flagellifera (whip-bearing). A garden form of *S. plumosa.*

S. flagelliformis (whip-like). A synonym of *S. plumosa flagellifera.*

S. flexuosa (flexuous). *stems* about 1ft. long, flat on the back, copiously branched, the lower branches elongated and copiously compound, the upper part assurgent; root-fibres often only developed from the lower half. *l.* of the lower plane close, spreading, bright green, oblong-rhomboidal, sub-acute, $\frac{1}{8}$in. to $\frac{1}{6}$in. long, more produced on the upper side of the distinct midrib, serrulated on the upper side near the base; leaves of the upper plane one-third as long, long-cuspidate. *spikes* $\frac{1}{2}$in. to 1in. long, square; bracts half a line long, crowded, sharply keeled. South Brazil. Stove.

S. formosa (beautiful). A form of *S. Martensii.*

S. fulcrata (fulcrate). *stems* $1\frac{1}{2}$ft. to 2ft. long, stiffly erect, simple in the lower half, with a few distant, small, adpressed leaves, deltoid and decompound in the upper half; pinnæ deltoid, the lower ones three or four-pinnate, the rachises pubescent; final branchlets contiguous, $\frac{1}{4}$in. to $\frac{1}{2}$in. long. *l.* of the lower plane rather spaced even on the branchlets, ascending, lanceolate, acute, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, truncate; leaves of the upper plane half as long, incurved, not cuspidate. *spikes* square, $\frac{1}{4}$in. to $\frac{1}{2}$in. long; bracts little longer than the sporangia. Eastern Himalayas. A well-marked, greenhouse species.

S. Galeottei (Galeotte's). *stems* 1ft. to 2ft. long, sub-erect, with root-fibres from the lower half, sometimes excurrent and whip-like at the tip, copiously pinnate, the branches pyramidal and decompound. *l.* of the lower plane close on the branchlets, spaced on the branches and stem, ascending, lanceolate or oblong-lanceolate, acute, $\frac{1}{8}$in. to $\frac{1}{6}$in. long, more produced on the upper side of the midrib, broadly rounded and shortly ciliated on the upper side at the base, truncate and auricled on the lower; leaves of the upper plane one-third to one-half as long, much imbricated. *spikes* $\frac{1}{8}$in. to $\frac{1}{2}$in. long; bracts cuspidate, strongly keeled. Mexico. Stove.

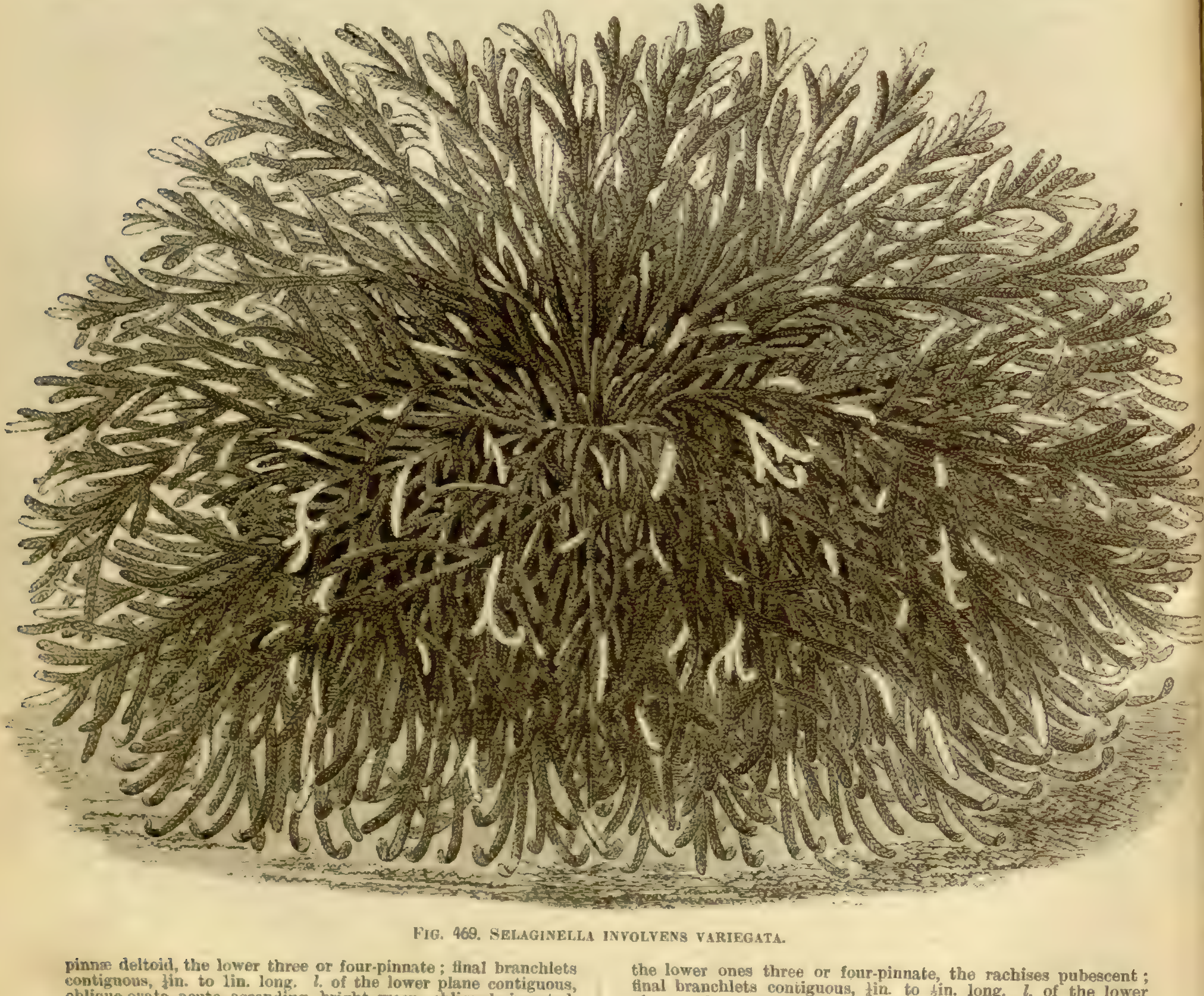

FIG. 469. SELAGINELLA INVOLVENS VARIEGATA.

Selaginella—*continued.*

S. grandis (great).* *stems* erect, 1½ft. to 2ft. long, simple in the lower half, deltoid and decompound in the upper half, the branching midway between flabellate and pinnate, the contiguous final branchlets ¾in. broad. *l.* of the lower plane crowded, lanceolate, very acute, ⅛in. to ⅙in. long, bright green, equilateral except at the base, slightly ciliated; leaves of the upper plane one-third as long, ovate-lanceolate, very acute, much imbricated. *spikes* copious, square, tetragonal, 1in. to 1½in. long; bracts strongly ciliated. Borneo, 1882. A very fine, stove plant. (G. C. n. s., xviii. p. 40.) SYN. *S. platyphylla* (of gardens).

S. hæmatodes (bloody).* *stems* 1ft. to 2ft. long, bright crimson, unbranched in the lower half, with leaves much spaced and adpressed, deltoid and decompound in the upper half; pinnæ deltoid, three or four-pinnate, the contiguous, erecto-patent ultimate divisions ½in. to 1in. long. *l.* of the lower plane contiguous, ascending, ovate or oblong-rhomboidal, acute, ⅛in. to ⅙in. long, bright green, dilated on the upper side at the base, broadly rounded; leaves of the upper plane minute, with a large cusp. *spikes* square, 1in. to 1½in. long; bracts ovate-lanceolate. Andes. Stove. One of the handsomest species. SYN. *S. filicina.*

S. helvetica (Swiss). *stems* densely matted, slender, pale, trailing, 2in. to 3in. long, forked at base, distantly pinnately branched, with short, erecto-patent, slightly compound branches. *l.* of the lower plane spreading, close or slightly spaced, half a line or more long, oblique, produced on the upper side; leaves of the upper plane acute, half as long, rather divergent. *spikes* distinctly pedunculate, ½in. to 1in. long, terete; bracts imbricated. Central Europe to Japan. Hardy. (J. F. A. 196, under name of *Lycopodium helveticum.*)

S. inæqualifolia (unequal-leaved). *stems* sub-erect, sarmentose, 3ft. to 4ft. long; pinnæ oblong-lanceolate, 6in. long, the erecto-patent branchlets considerably compound, with ascending tertiary divisions. *l.* of the lower plane contiguous, oblong-rhomboid, $\frac{1}{12}$in. to ⅛in. long, bright green; leaves of the upper plane half as long, shortly cuspidate. *spikes* square, ¼in. to ½in. long; bracts ovate, cuspidate, strongly keeled. Eastern Himalayas. A well-known, stove species.

S. i. perelegans (very elegant). *stems* not more than 1ft. long; pinnæ shorter, more deltoid, with more compound lower branches. *spikes* copious, often 1in. long. SYN. *S. bellula* (of Moore) (G. C. n. s., xi. p. 173).

S. involvens (rolled up). *stems* very densely tufted, 2in. to 6in. long, deltoid, twice or thrice pinnate, branched nearly or quite from the base, the branching of all grades between flabellate and pinnate. *l.* of the lower plane very crowded, ascending, ovate, with a distinct cusp, about one line long, bright green, very thick, serrulated, nearly equal-sided; leaves of the upper plane nearly as long, oblique, distinctly cuspidate. *spikes* square; bracts acutely keeled. Japan, China, &c. Greenhouse. (G. C. n. s., xix. p. 404.)

S. i. texta (woven). A peculiar garden form, in which the branches are almost simple. SYN. *S. texta* (of Belgian gardens).

S. i. variegata (variegated). This only differs from the type in having the tips of some of the branches creamy-white. See Fig. 469, for which we are indebted to Mr. Wm. Bull.

S. japonica (Japanese). A variety of *S. caulescens.*

S. Karsteniana (Karsten's). *stems* about 1ft. long, erect from a decumbent base, bisulcate down the face, copiously pinnate; branches short, erecto-patent, sparingly compound. *l.* of the lower plane ovate, acute, dark green, sub-diaphanous, very unequal-sided, denticulate on the upper margin, much produced on the upper side at base and imbricated over the stem; leaves of the upper plane one-third as long, ovate-oblong, cuspidate. *spikes* short, often twin, but little flattened; bracts not very obviously dimorphous. New Grenada. Greenhouse.

S. Kraussiana (Krauss').* *stems* trailing, 6in. to 12in. long, jointed at the nodes, copiously pinnate, with copiously compound, erecto-patent branches. *l.* of the lower plane contiguous on the branchlets, spaced on the branches and main stems, oblong-lanceolate, acute, ⅛in. to ⅙in. long, bright green, ciliated and broadly rounded at base; leaves of the upper plane one-third as long, not cuspidate. *spikes* short, square; bracts cuspidate, strongly keeled. South Africa, 1878. Greenhouse. *S. Brownii* is a dwarf form from the Azores. The form *aurea* has yellow leaves; *variegata* is a variegated form.

S. lævigata (smooth).* *stems* erect, 1ft. to 1½ft. long, simple in the lower half, the leaves small, distant and soon deciduous, deltoid in the upper half, with petiolate, deltoid, once or twice pinnate pinnæ; final divisions erecto-patent, 2in. to 3in. long. *l.* of the lower plane crowded, oblong-lanceolate, sub-patent, very falcate, acute, ⅛in. to ⅙in. long, bright green, adnate by a broad base, decurrent on the lower side; leaves of the upper plane minute, recurved. *spikes* square, ½in. to 1in. long; bracts acute, strongly keeled. Madagascar. Stove.

S. l. Lyalli (Lyall's). *stems*, lower pinnæ bipinnate, with final divisions ½in. to 1in. long. A more compound variety.

S. lepidophylla (scaly-leaved).* The Resurrection Club-moss, which is frequently exposed for sale as a vegetable curiosity, owing to the manner in which its curled-up stems unroll and resume a fresh appearance when placed in water. *stems* densely tufted, 2in. to 4in. long, branched to the base, the primary branching closely pinnate, the broad, cuneate, ascending pinnæ copiously sub-flabellately compound. *l.* of the lower plane much imbricated, ascending, oblique, ovate, obtuse, half a line long, minutely ciliated, when old tinted red-brown; leaves of the upper plane nearly as long, obtuse. *spikes* square, ¼in. to ½in. long; bracts deltoid, acutely keeled. Texas to Peru. Greenhouse. (G. C. 1872, p. 69.)

S. Lobbii (Lobb's). *stems* sub-erect, sarmentose, 3ft. to 4ft. long; pinnæ regular, lanceolate-deltoid, about 6in. long, cuneate at base; pinnules contiguous, erecto-patent, the upper ones simple, the lower forked. *l.* of the lower plane contiguous, oblong-lanceolate, falcate, acute, ⅛in. long on the pinnules, ⅙in. to ⅕in. on the pinnæ, bright green, truncate and rather dilated on both sides at base; leaves of the upper plane one-third as long, cuspidate. *spikes* square, oblique-ovate, terminal on the branchlets, ¼in. to ¾in. long; bracts cuspidate, strongly keeled. Borneo. Stove. Rare in cultivation. SYN. *S. cognata.*

S. ludoviciana (Louisianian). *stems* slender, copiously pinnate, flat, 6in. long, the upper branches simple, the lower slightly compound. *l.* of the lower plane much spaced below the tips of the branches, spreading, ovate-oblong, sub-acute, half a line or more long, serrulated, imbricated over the stem; leaves of the upper plane half as long, cuspidate. *spikes* ¼in. to ½in. long; bracts one line long, strongly keeled. United States. A well-known, greenhouse species, allied to *S. apus.*

S. Lyalli (Lyall's). A form of *S. lævigata.*

S. Martensii (Martens').* *stems* 6in. to 12in. long, trailing in the lower half, with copious, long root-fibres, ascending in the upper half, decompound, the branching between pinnate and flabellate. *l.* of the lower plane usually crowded, erecto-patent, oblong-lanceolate, sub-obtuse, bright green, unequal-sided, serrulated, a little imbricated; leaves of the upper plane half as long, with a long cusp, much imbricated. *spikes* ¼in. to ½in. long, square; bracts acute, strongly keeled. Mexico. A common, greenhouse species, with numerous varieties, of which the most distinct are: *ascendens, divaricata, formosa,* the variegated *robusta,* and *stolonifera.*

S. molliceps (soft-stemmed). *stems* erect, densely tufted, 6in. to 9in. long, copiously pinnate, the base bisulcate; lower branches copiously compound. *l.* of the lower plane contiguous on the branchlets, spaced on the main stem, erecto-patent, obliquely oblong-lanceolate, acute, dark green, one line long, very unequal-sided, serrulated on the upper edge, broadly rounded, shortly ciliated, and a little imbricated over the stem on the upper side at base; leaves of the upper plane one-half to one-third as long, ovate or ovate-lanceolate, cuspidate. *spikes* copious, resupinate, ⅛in. to ⅙in. long; bracts of the upper plane lanceolate-rhomboid, those of the lower plane ovate, cuspidate. Upper Guinea. Stove. SYN. *S. rubricaulis.*

S. mutabilis (changeable). A synonym of *S. serpens.*

S. patula (spreading). *stems* slender, pale, trailing, 6in. to 9in. long, with a long, whip-like tip, and numerous short, alternate, pinnately-arranged branches with three to seven branchlets. *l.* of the lower plane crowded, erecto-patent, oblong-lanceolate, bright green, the midrib distinct, ciliated and imbricated over the rachis on the upper side at the base; leaves of the upper plane one-third as long, oblique-ovate, acute. *spikes* square, ¼in. to ½in. long; bracts cuspidate, much imbricated, strongly keeled. Jamaica. A common, greenhouse species.

S. pilifera (hair-bearing). *stems* densely tufted, 3in. to 4in. long, copiously compound, cuneate, the branching midway between pinnate and flabellate, the branches erecto-patent. *l.* of the lower plane crowded on the branches, rather spaced on the main stem, ascending, oblique-ovate, half a line long, distinctly cuspidate. *spikes* square, ¼in. to ½in. long; bracts strongly keeled. Texas. Greenhouse. A rare species in cultivation.

S. platyphylla (flat-leaved). A garden synonym of *S. grandis.*

S. plumosa (feathery). *stems* pale, trailing, 6in. to 12in. long, often forked low down, copiously pinnately branched, the branches copiously compound, the root-fibres extending to the upper nodes. *l.* of the lower plane contiguous on the branches, spreading or rather ascending, bright green, oblong- or ovate-lanceolate, acute, $\frac{1}{12}$in. to ⅛in. long, ciliated at base, cordate on the upper side and much imbricated over the stem; leaves of the upper plane one-third as long, ovate, cuspidate, much imbricated. *spikes* copious, square, ¼in. to ½in. long; bracts acute, strongly keeled. Eastern Himalayas. Stove. *S. flagellifera* is merely a garden form of this species. SYN. *S. flagelliformis.*

S. Pœppigiana (Pœppig's). *stems* trailing, 1ft. to 2ft. long, forked at base, jointed at the nodes, copiously pinnate, with copiously compound, erecto-patent branchlets. *l.* of the lower plane spaced, except towards the tips of the branchlets, much spaced on the main stem, ascending, oblong-lanceolate, ⅛in. to ⅙in. long, broadly rounded on the upper side at base; leaves of the upper plane one-third as long, oblique, with a distinct cusp. *spikes* square, ¼in. to ½in. long; bracts acute, sharply keeled. Andes. Greenhouse.

S. Poulteri (Poulter's).* *stems* densely tufted, very slender, sub-erect, 2in. to 3in. long, three or four times trichotomously-forked, with slender radicles from the lower half. *l.* of the lower plane distinctly spaced, spreading, sub-orbicular, obtuse, half a line long, bright green; leaves of the upper plane nearly as long, but acute, ascending. *spikes* slender, ½in. to 1in. long; bracts scarcely longer than the sporangia. Azores, 1868. Greenhouse.

Selaginella—*continued.*

S. rigida (rigid). A garden name for *S. affinis.*

S. robusta (robust). A garden name for *S. canaliculata robusta.*

S. rubella (reddish). *stems* 1ft. long, sub-erect, with root-fibres from the lower half, reddish-brown, pinnately branched, the lower branches cuneate, with five to seven branchlets. *l.* of the lower plane ascending, crowded on the branchlets, oblique-oblong, obtuse or obscurely cuspidate, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, dark green, turning reddish with age, more produced and ciliated on the upper side at the base; leaves of the upper plane half as long, ovate, cuspidate, much imbricated. *spikes* square, $\frac{1}{2}$in. to 1in. long; bracts long-cuspidate, strongly keeled. Native country unknown, 1870. Greenhouse. (G. C. 1871, p. 902.)

S. rubricaulis (red-stemmed). A synonym of *S. molliceps.*

S. selaginoides (Fir Club-moss-like). A synonym of *S. spinosa.*

S. serpens (winding). *stems* densely matted, quite trailing, 6in. to 9in. long, copiously pinnate, branched, with numerous, erecto-patent, slightly compound branches. *l.* of the lower plane crowded, spreading, three-quarters of a line long, ovate-oblong, bright green with a distinct midrib, both sides rounded and ciliated at base; leaves of the upper plane one-third as long, acute. *spikes* square, $\frac{1}{4}$in. to $\frac{1}{2}$in. long; bracts cuspidate, crowded, strongly keeled. West Indies. A well-known, stove species. SYNS. *S. mutabilis, S. variabilis, S. varians.*

S. setosa (bristly). A garden form of *S. erythropus.*

S. sinensis (Chinese). A garden synonym of *S. canaliculata.*

S. spinosa (spiny). *barren stems* short, trailing, slender, little branched, with short, ascending branches. *l.* lax and spreading on the lower part of the barren branches, dense and ascending upwards, lanceolate, half a line to one line long, acute, bright green, ciliated. *fertile stems* erect, simple, 2in. to 3in. long, with a leafy peduncle about as long as the spike. *spike* multifarious; bracts lax, ascending, lanceolate or ovate-lanceolate, $\frac{1}{6}$in. to $\frac{1}{8}$in. long, strongly ciliated, not acutely keeled. Europe (Britain), North America. Hardy. SYN. *S. selaginoides.*

S. spinulosa (small-spined). *stems* very slender, trailing, 1in. to 2in. long, little-branched. *l.* of the lower plane spaced even on the branchlets, oblong, obtuse, half a line long, pale green, strongly ciliated; leaves of the upper plane a quarter to one-third as long, oblong, acute. *spikes* short, square; bracts cuspidate, strongly keeled. Java. Stove.

S. stolonifera (stolon-bearing). A form of *S. Martensii.*

S. suberosa (slightly erose). *stems* densely tufted, sub-erect, often above 1ft. long, pale, shining brown, copiously pinnate, the branching erecto-patent and decompound, the root-fibres sometimes extending half-way up to it. *l.* of the lower plane spaced and erecto-patent on the branches, very distant and spreading on the main stem, oblique-lanceolate or ovate-lanceolate, acute, bright green, unequal-sided, much produced, broadly rounded, shortly ciliated; leaves of the upper plane half as long, long-cuspidate. *spikes* copious, $\frac{1}{4}$in. to $\frac{1}{2}$in. long, resupinate; bracts of the upper plane lanceolate, erecto-patent, of the lower plane ascending, ovate, cuspidate. Khasia Mountains. Greenhouse.

S. sulcata (furrowed). *stems* trailing in the lower half, usually assurgent in the upper half, deeply bisulcate down the face, jointed at the nodes, copiously flabellate-pinnate, the final branchlets contiguous. *l.* of the lower plane close on the branchlets, spaced on the stem, oblong-lanceolate, acute, $\frac{1}{8}$in. to $\frac{1}{6}$in. long, auricled on both sides at base; leaves of the upper plane one-third as long, long-cuspidate. *spikes* $\frac{1}{4}$in. to $\frac{1}{2}$in. long, square; bracts acute, strongly keeled. South Brazil. Greenhouse.

S. texta. *See* **S. involvens texta.**

S. uncinata (hooked).* *stems* weak, slender, pale straw-coloured, bisulcate on the face, trailing, 1ft. to 2ft. long, with a long, excurrent tip, and alternate, short, pinnately arranged, copiously compound branches. *l.* of the lower plane sub-ovate, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, close or rather spaced on the branches, thin, bright blue-green, minutely petiolate, both sides cordate at base; leaves of the upper plane one-third as long, cuspidate, much imbricated. *spikes* $\frac{1}{4}$in. to $\frac{1}{2}$in. long, square; bracts one line long, crowded, sharply keeled. China. A well-known, greenhouse species. This is the proper name of the blue-tinted plant known in gardens as *S. cæsia.*

S. variabilis (variable). A synonym of *S. serpens.*

S. varians (variable). A synonym of *S. serpens.*

S. Victoriæ (Victoria's). *stems* sub-erect, sarmentose, 3ft. to 4ft. long; pinnæ lanceolate-deltoid, 6in. to 9in. long, caudate; upper pinnules erecto-patent and simple, contiguous, the lower forked or slightly pinnate. *l.* of the lower plane crowded, oblong-lanceolate, falcate, acute, one line long, dark bright green, obscurely petiolate; leaves of the upper plane a quarter as long, much imbricated. *spikes* square, 1in. to 2in. long; bracts acutely keeled. Borneo, &c., 1879. Stove. Rare in cultivation. (G. C. n. s., xi. p. 75.)

S. viticulosa (tendrilled). *stems* about 9in. long, stramineous, simple in the lower part, deltoid and decompound upwards; pinnæ deltoid, bi- or tripinnate, the root-fibres sometimes extending to the axils of the lowest pinnæ, the contiguous, ascending final segments $\frac{1}{4}$in. to 1in. long. *l.* of the lower plane contiguous, ascending, lanceolate or oblique-ovate, acute, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, bright green; leaves of the upper plane one-third as long, oblique-ovate, cuspidate. *spikes* square; bracts cuspidate, strongly keeled. Central America and Venezuela. Stove.

S. Vogelii (Vogel's). *stems* 1ft. to 2ft. long, erect, simple in the lower half, often pink-tinted, with a few distant, small, adpressed leaves, deltoid and decompound in the upper half; lower pinnæ deltoid, petiolate, three or four-pinnate, the contiguous, erecto-patent final divisions $\frac{1}{2}$in. to $\frac{3}{4}$in. long. *l.* of the lower plane spaced even on the branchlets, lanceolate or oblong-lanceolate, ascending, acute, one to two lines long, bright green, both edges liable to be revolute, truncate at base; leaves of the upper plane minute, with a large cusp. *spikes* square, $\frac{1}{4}$in. to $\frac{1}{2}$in. long; bracts cuspidate, strongly keeled. West Africa. Stove. Well known in cultivation. SYN. *S. africana.* There is a variegated form. *S. dichrous* is a garden form of this species.

S. Wallichii (Wallich's).* *stems* sarmentose, sub-erect, 2ft. to 3ft. long; pinnæ lanceolate, 6in. to 9in. long; pinnules invariably simple, crowded, erecto-patent, 1in. to $1\frac{1}{2}$in. long, the end one sometimes 3in. to 4in. long. *l.* of the lower plane crowded, oblong-lanceolate, slightly falcate, pointed at the upper corner, equal-sided, the lower ones of the pinnules $\frac{1}{12}$in. to $\frac{1}{8}$in. long, the upper gradually smaller, dark bright green, obscurely petiolulate, truncate or slightly cordate on both sides at the base; leaves of the upper plane a quarter as long, much imbricated. *spikes* square, terminal on the pinnules, $\frac{1}{2}$in. to 1in. long; bracts cuspidate, strongly keeled. India. A common and ornamental, stove species.

S. Willdenovii (Willdenow's).* *stems* climbing to a length of 12ft. to 20ft. or more; pinnæ spreading, deltoid, 1ft. to 2ft. long, pinnules deltoid and decompound; ultimate branches short and contiguous. *l.* of the lower plane crowded, ascending, ovate or oblong, $\frac{1}{12}$in. to $\frac{1}{8}$in. long, green with a tint of blue, obscurely petiolate, cordate on both sides at base; leaves of the upper plane one-third as long, not cuspidate. *spikes* square, $\frac{1}{2}$in. to 1in. long; bracts scarcely larger than the sporangia. Cochin China, &c. A well-known, stove species. SYN. *S. cæsia arborea.*

SELAGO (the old Latin name, used by Pliny, for a plant which the Druids gathered with mysterious ceremonies). ORD. *Selagineæ.* A genus comprising nearly eighty species of greenhouse shrubs or under-shrubs, often Heath-like, rarely dwarf, annual herbs; one is a native of Madagascar, another is found in tropical Africa, and the rest are extra-tropical South African. Flowers in the axils of the ovate or narrow bracts, or rarely shortly pedicellate with a bract, in terminal spikes; calyx two, three, or five-cleft; corolla limb oblique or sub-bilabiate; stamens four, didynamous. Leaves narrow or rather small, sometimes very small, alternate, scattered, or the lower ones rarely opposite; often fascicled in the axils, entire or toothed. A selection of species, including those best known in gardens, is given below. They are of easy culture in sandy loam or peat and sand. Propagation may be effected by seeds; or by cuttings of half-ripened wood, inserted in sandy soil, under a bell glass, in bottom heat. All are South African sub-shrubs, flowering in summer.

FIG. 470. FLOWERING BRANCH OF SELAGO DISTANS.

S. corymbosa (corymbose). *fl.* white, corymbose; corolla tube scarcely exceeding the calyx; bracts ovate-linear. *l.* linear, fascicled. Stem erect, branched, pubescent. *h.* 2ft. 1699.

S. c. polystachya (many-spiked). *fl.* loosely paniculate-spiked or thyrsoid; corolla larger. *l.* acute, flat. *h.* 9in. 1823.

S. distans (distant). *fl.* white; calyx segments acuminate, shorter than the corolla tube; spikes solitary, terminal, scattered-flowered; bracts oblong. *l.* fascicled, two to three lines long, slightly incurved, semi-terete, obtuse. Stems sub-dichotomously branched; branchlets pubescent. *h.* 1ft. 1845. See Fig. 470. (B. R. xxxi. 46.)

S. fasciculata (fascicled). A synonym of *S. serrata.*

S. fruticosa (shrubby). *fl.* yellow, in pedunculate heads, spikes, or panicles; corolla scarcely exceeding the calyx. *l.* linear, slightly obtuse, glabrous, slightly spreading or the lower ones reflexed, solitary or sub-fasciculate, the margins revolute. *h.* 1ft. 1774.

Selago—*continued.*

S. Gillii (Gill's).* *fl.* pink; corolla tubular; spikelets terminal, 1in. to 3in. long, or the panicle shortened and loosely few-flowered. *l.* clustered, whitish, glabrous, elliptic-lanceolate or the lower ones ovate, three to six lines long. Stem branched. *h.* 6in. 1829. (B. M. 3028; B. R. 1504.)

S. rapunculoides (Rampion-like). A synonym of *S. spuria.*

S. rotundifolia (round-leaved). *fl.* purple; corolla tube filiform, three or four times longer than the calyx; spikelets terminal, straight, pedunculate, scarcely 1in. long. *l.* obovate-elliptic, glabrous, entire, clustered-fasciculate. Stem straight, terete. *h.* 1ft. 1814.

S. serrata (toothed). *fl.* blue, disposed in long spikes or fascicled corymbs; corolla tube filiform, elongated; bracts linear-subulate. *l.* obovate-elliptic, acute, serrated, decurrent, often glabrous. Stems straight, leafy. *h.* 1ft. 1774. SYN. *S. fasciculata* (B. R. 184; L. B. C. 1423).

S. spuria (spurious). *fl.* violet; corolla tube filiform, very long; spikes short, terminal. *l.* linear-elongated, acute, toothed, the upper ones shorter and entire. Stem nearly simple, erect. *h.* 2ft. 1824. SYN. *S. rapunculoides.*

SELANDRIA CERASI. A name formerly given in England to the Sawfly now known as *Eriocampa limacina*, the parent of the dreaded Slugworm, frequently so destructive to most kinds of fruit-trees, *e.g.*, Cherry, Pear, and many others, as well as to several forest-trees, *e.g.*, Oak and Birch. *See* **Slugworms.**

SELATIUM. A synonym of *Gentiana.*

SELENIA (probably from *selene*, the moon; connection not obvious). ORD. *Cruciferæ.* A small genus (two species) of small, hardy, annual herbs, natives of Texas and Arkansas. Flowers yellowish, in terminal, leafy racemes; sepals spreading, coloured, sub-equal; petals erect. Leaves pinnatisect. *S. aurea*, whether for the colour or odour of its flowers, or for the considerable time it remains in blossom, is well worthy of cultivation. It requires similar treatment to other hardy annuals.

S. aurea (golden).* *fl.* erect, the lower ones solitary in the upper axils, the upper ones collected into a sub-corymbose raceme; sepals greenish-yellow; petals golden-yellow, twice as long as the sepals, obovate-spathulate. June. *l.* 1in. to 2in. long, ½in. to ½in. broad, linear-oblong, pinnatifid; segments about five to seven pairs. *h.* 9in. 1881. (B. M. 6607.)

SELENIPEDIUM (from *selenis*, a little crescent, and *pedion* or *podion*, a slipper; in allusion to the crescentic, slipper-shaped labellum). South American Lady's Slipper. Including *Uropedium.* ORD. *Orchideæ.* A genus comprising about a dozen species of stove, terrestrial orchids, differing from *Cypripedium* in having a three-celled and three-furrowed or three-lobed ovary; they inhabit the mountainous parts of South America. Flowers showy or rarely mediocre, pedicellate; sepals spreading; petals free; lip sessile, spreading, inflated like a slipper; peduncles many-flowered. Stem erect, leafy. Regarding *S. Schlimii*, Mr. B. S. Williams remarks (in the "Orchid Grower's Manual"): "This is a difficult plant to cultivate. The imported plants appear as if they had been growing beside streams of water which are subjected to being flooded, for the leaves are frequently coated to a great extent with deposited mud; and it would, therefore, appear that our difficulties with this plant have arisen chiefly from an insufficient supply of water. We pot in peat, adding a little turfy loam and sand, with good drainage, and take care that water does not lodge in the heart of the plant. It is best grown at the cool end of the Cattleya house." For general culture, *see* **Cypripedium** (under which the species were formerly included).

S. Ainsworthii (Ainsworth's).* *fl.*, upper sepal whitish or yellowish-green, bordered with pale purple, the lower one very wide, ventricose; petals rather broad, purple, with a green mid-vein and a pallid area near the base; side laciniæ of lip reflexed, pale sulphur-yellow, copiously spotted inside at base; staminode sulphur-colour, with a dark purple, hairy border outside. 1878. A hybrid between *S. Sedeni* and *S. Roezlii.*

S. albo-purpureum (white-and-purple). *fl.* much larger than in *S. Sedeni*; dorsal sepal having a pinkish tinge on the margin, elongated-ovate; petals pinkish, 5in. to 6in. long, twisted, hanging down beyond the lip; pouch of the lip dull crimson-red, the inflected edges at its base ivory-white, bordered with pink, and nearly covered by rosy spots. *l.* long, green, linear-lorate. A handsome garden hybrid between *S. Dominianum* and *S. Schlimii.* SYN. *Cypripedium albo-purpureum* (Gn. xxi. 332).

S. calurum (beautiful-tailed).* *fl.* large and showy, freely produced; dorsal sepal pale green, longitudinally ribbed with purple; petals pale green, edged with rose-red near the base, wholly bright rose-red at apex, 2½in. long, narrower and more twisted than in *S. Sedeni*; lip of a deep wine-crimson outside, very handsome. *l.* elongated, channelled, acute, green, in a thick tuft. Stems tall, branched, brownish-red. A handsome, free-flowering hybrid between *S. longifolium* and *S. Sedeni.* SYN. *Cypripedium calurum* (F. & P. 1884, 145; W. O. A. iii. 136).

FIG. 471. INFLORESCENCE OF SELENIPEDIUM DOMINIANUM.

S. cardinale (cardinal). *fl.*, dorsal sepal blush-white, faintly striped with green; petals blush-white, with a patch of crimson-purple hairs towards the base; lip similar to that of *S. Schlimii*, but about 1in. in diameter. December. A beautiful hybrid between *S. Sedeni* and *S. Schlimii albiflorum.*

S. caricinum (Carex-like).* *fl.* pale green, the sepals and petals having a white margin, and the ends being blotched with brown; petals narrow, deflexed and twisted; lip black-dotted on the inner margin, oblong; staminode bordered with black hairs; spike rising clear of the leaves, four to seven-flowered. *l.* stiff, narrow, channelled. *h.* 1ft. or more. Peru. Plant having a Sedge-like appearance. SYNS. *S. Pearcei* (F. d. S. 1648), *Cypripedium caricinum* (B. M. 5466).

S. caudatum (tailed).* *fl.*, sepals and petals yellowish, marked with brown; petals tail-like, often reaching 2½ft. in length, more deeply coloured towards the base; lip reddish-brown, the basal portion yellow, spotted with reddish-brown; scapes 1ft. to 1½ft. high. April and May. *l.* ensiform, distichous, light green.

Selenipedium—*continued.*

Chiriqui, Peru, 1851. A very remarkable, stemless, evergreen orchid. SYN. *Cypripedium caudatum* (F. d. S. 565; G. C. n. s., iii. p. 211; Gn. iii. 313; L. & P. F. G. i. 9; R. G. 661; R. H. 1857, p. 318, and 1885, p. 472; W. S. O. ii. 1).

S. c. roseum (rose-coloured). *fl.* dark rose, intermixed with the yellow and green. (I. H. 1886, 596.)

S. conchiferum (shell-bearing). *fl.*, dorsal sepal whitish, veined with pale greenish-yellow, oblong-triangular; petals white, veined with green at base, brownish-crimson towards the tips, twisted, ribbon-like; lip pale olive-green, having the inflexed side lobes spotted with brown, and covered at the top with green warts. A hybrid between *S. caricinum* and *S. Roezlii.*

S. Dominianum (Dominy's).* *fl.* yellowish-green, tinged with coppery-brown; lip deep reddish-brown in front, with sharper reticulations, yellowish-green behind, the incurved mouth also yellowish, spotted with dark purple; stems erect, three-flowered. *l.* linear-elongate, broader than in *S. caricinum*, between which and *S. caudatum* this plant is a hybrid. See Fig. 471. SYN. *Cypripedium Dominianum* (F. M. 499; F. & P. 1874, 57; Gn. iii. 491).

S. grande (large).* *fl.* large; dorsal sepal yellowish-white, veined with yellowish-green, elongated, incurved; petals ribbon-like, more than 1ft. long, pendulous, broadest at base, where they are yellowish-white and hairy, the narrow part crimson; lip large and prominent, narrow at base, where the unfolded lobes are whitish, spotted with crimson, the front part greenish-yellow, paler and whitish beneath; staminode yellow, flushed with crimson, fringed on its upper edge with blackish-crimson hairs; scape 3ft. high, many-flowered. *l.* sword-shaped, 2ft. to 2½ft. long. A grand hybrid between *S. caudatum* and *S. Roezlii.*

S. Hincksianum (Hincks'). *fl.*, sepals whitish-green, with nerves of a darker tint; petals light greenish, with a deep greenish middle line and a brown border at base, the tails brown; lip green, marked with some small, brown spots near the base, long and narrow. Darien, 1878. SYN. *Cypripedium Hincksianum.*

S. kaieteurum (Kaieteur Fall). A synonym of *S. Lindleyanum.*

S. Lindeni (Linden's).* *fl.*, sepals white, veined with green, broad, oval-lanceolate, the linear-ligulate petals and lip velvety-white, streaked with green at base, the points lengthened out into purplish-red, tail-like appendages, sometimes 2ft. long; scape branching, velvety, two-flowered, 1ft. or more high. May. *l.* erect, ligulate, obtuse, pale green, 10in. long, forming a distichous tuft. New Grenada, 1850. SYN. *Uropedium Lindeni* (B. H. 1854, 193; F. d. S. vi. 123; R. G. 315; R. H. 1857, p. 511; R. X. O. 15).

S. Lindleyanum (Lindley's). *fl.*, sepals pale green, with reddish-brown nerves on the outside, pubescent, with crisped margins, the upper one hooded at apex; petals pale green, with brownish-crimson veins, 2½in. long, falcately linear, the margins recurved and ciliated; lip light olive-green, with brownish-crimson veins, and densely dotted on the side lobes; scape many-flowered, pubescent. *l.* coriaceous, bright dark green, 7in. to 9in. long, 2in. to 2½in. broad. Kaieteur Fall, British Guiana, 1885. SYN. *S. kaieteurum.*

S. longifolium (long-leaved). *fl.*, dorsal sepal yellowish-green, streaked with purple, the lower ones large; petals green, with a red marginal band, bordered with white, several inches long; lip green, suffused with shining purplish-brown; spike many-flowered. *l.* distichous, long-ligulate, keeled, dark green. Central America, 1869. SYN. *Cypripedium longifolium* (B. H. 1873, p. 65; B. M. 5970; F. & P. 1871, 126), *C. Reichenbachianum.*

S. l. coloratum (coloured). *fl.* with purplish-veined sepals and purplish petals. *l.* broader. 1873. A fine variety.

S. Pearcei (Pearce's). A synonym of *S. caricinum.*

S. porphyreum (porphyry-coloured). *fl.* nearly purplish, very much like those of *S. Sedeni*, but the open sides of the slipper-like lip are not provided with tumid protuberances, and both petals and the odd sepal are very distinctly shaped, more tapered to the point. *l.* as in *S. Roezlii.* 1878. A hybrid between *S. Roezlii* and *S. Schlimii.*

S. reticulatum (reticulated). *fl.* whitish, reticulately veined with green; dorsal sepal narrow-lanceolate, acute; lower ones broadly elliptic-oblong, very obtusely rounded at apex; petals linear, acute, twisted, horizontally spreading. Ecuador, 1885. A remarkable species.

S. Roezlii (Roezl's).* *fl.* very large; dorsal sepal yellowish-green, suffused with rosy-purple on the borders, the lateral ones flesh-coloured; petals green, with a bright red-purple border and tip, linear-lanceolate, spreading; lip 3in. long, the saccate part greenish-yellow; scape many-flowered, 3ft. high. March to May. *l.* 2ft. long, 2in. broad, bright green, ligulate, keeled. New Grenada, 1873. SYN. *Cypripedium Roezlii* (B. M. 6217; F. M. ser. ii. 119; I. H. ser. iii. 138; R. G. 754).

S. Schlimii (Schlim's).* *fl.* 2in. across; sepals and petals white, mottled and striped with dark rose; lip white, the front of the pouch marked with a large blotch of deep rose; stem hairy, longer than the leaves, branching, eight-flowered. *l.* ligulate, acute, 8in. long, light green. New Grenada, 1867. See Fig. 472. SYN. *Cypripedium Schlimii* (B. M. 5614; F. d. S. 1917; I. H. ser. iii. 183; R. X. O. i. 44).

Selenipedium—*continued.*

S. S. albiflorum (white-flowered). *fl.*, sepals and petals white, dusted with delicate pink at the base; lip white, suffused with rose, more deeply coloured opposite the bright yellow column. Winter. 1875. A robust, free-growing variety. SYN. *Cypripedium Schlimii albiflorum* (I. H. 183).

FIG. 472. INFLORESCENCE AND LEAF OF SELENIPEDIUM SCHLIMII.

S. Schröderæ (Baroness Schröder's).* *fl.*, dorsal sepal pale reddish-green, lined with greenish-purple; petals whitish-green in the centre, stained with purplish-crimson, 4in. long, very broad, turned downwards; lip dull crimson, resembling that of *S. caudatum.* December. *l.* as in *S. Sedeni.* Stems branching. A very distinct hybrid between *S. caudatum* and *S. Sedeni.* (W. O. A. 196.)

S. Sedeni (Seden's).* *fl.* large and showy; sepals greenish-white, ovate; petals longer, white, edged with purplish-crimson, twisted; lip rich crimson, white and crimson-spotted inside; stem taller than the leaves, bearing several flowers. *l.* ligulate, tapering, about 1ft. long, deep green. A handsome hybrid between *S. longifolium* and *S. Schlimii.* See Fig. 473. SYN. *Cypripedium Sedeni* (F. M. ser. ii. 206, 302; R. G. 1875, p. 150, and 1877, p. 86; R. H. 1879, p. 470).

S. S. candidulum (whitish). *fl.*, sepals and petals white, with a rosy hue on the edge; lip purple. A hybrid between *S. longifolium* and *S. Schlimii albiflorum.*

S. stenophyllum (narrow-leaved). *fl.*, dorsal sepal rosy, very pallid, green-nerved; the lower one the same colour, but nearly white in the centre, shell-like; petals purplish at their ends, much bearded towards the cordate base; lip pale purplish, the mouth of the inflexed lobes greenish-white, and streaked with rows of purple blotches. *l.* lorate, linear-ligulate, acute, very long. 1876. A hybrid between *S. Schlimii* and *S. caricinum.*

S. vittatum (striped). *fl.*, sepals pale green, the upper one only half as broad as the lower, striped with red; petals brownish-red, lined with green towards the base, linear, arcuate-deflexed, undulated; lip brownish, inside green, spotted with reddish-brown, shorter than the lower sepals, and half as long as the petals; scape 1ft. to 1½ft. high, minutely puberulous, few-flowered. *l.* 1ft. long, linear-ligulate, acute, bright green, very distinctly margined with yellow. Brazil, 1876. (I. H. 238.)

S. Wallisii (Wallis'). *fl.*, sepals pale green, striped and slightly spotted with bright green; petals white, veined with green, about 8in. long, passing into very narrow tails, tinted with very pale brown at apex; lip large, white, spotted and veined with crimson, the mouth margined with yellow; stems three to five-flowered. *l.* ligulate, acute. Ecuador. SYN. *Cypripedium Wallisii* (R. X. O. 181).

SELF-HEAL, or **ALL-HEAL**. *See* **Prunella vulgaris.**

SELINUM (from *Selinon*, the Greek name for Parsley; applied to this genus on account of the resemblance in the leaves). SYNS. *Cnidium, Mylinum.* Including *Oreocome.* ORD. *Umbelliferæ.* A genus comprising about twenty-five species of mostly hardy, branched, glabrous, perennial herbs; one is found in the mountainous parts of Columbia, and another in South Africa, the rest being all natives of the Northern hemisphere. Flowers white or rarely yellowish-green, in compound, many-rayed umbels. Leaves pinnately decompound. The species possess no interest from a garden standpoint.

SELLIGUEA. Included under **Gymnogramme** (which *see*).

SEMECARPUS (from *semeion*, a mark, and *karpos*, a fruit; the black, acrid juice of the nut is used by the natives for marking cotton cloths). ORD. *Anacardiaceæ.* A genus comprising about a score species of stove, evergreen trees, inhabiting tropical Asia, and especially abundant in Ceylon. Flowers small; calyx five-cleft, the segments imbricated, deciduous; petals five, spreading, imbricated; stamens five; panicles terminal or lateral, branched, bracteate. Nuts or drupes reniform. Leaves alternate, simple, coriaceous, on simple petioles. The only species introduced requires culture similar to **Anacardium** (which *see*).

FIG. 473. SELENIPEDIUM SEDENI.

S. Anacardium (Anacardium). Kidney Bean of Malacca. *fl.* greenish-yellow, disposed in a terminal, tomentose panicle. July and August. *l.* oblong, rather blunt, beneath glaucous and more or less covered on the nerves with scabrous down. *h.* 50ft. East Indies (on mountains), 1824. (B. F. S. 166.)

S. A. cuneifolium (cuneate-leaved). *l.* wedge-shaped and acuminate at base, blunt at apex.

SEMEIANDRA (from *semeion*, a mark, signal, and *aner, andros*, a male; in allusion to the conspicuous shape of one of the stamens). ORD. *Onagrarieæ.* A genus

Semeiandra—*continued.*

comprising only two species of slender, pubescent, greenhouse, evergreen shrubs, inhabiting the mountains of Mexico. Flowers scarlet, showy, axillary, solitary, pedunculate; calyx coloured, four-lobed, globose at base; petals four, small, linear-subulate; stamens two, one ending in a petal-like expansion, the other with two perfect cells. Leaves usually opposite, petiolate, oblong-lanceolate, serrated, membranous. One of the species has been introduced. It requires culture similar to **Fuchsia** (which *see*).

S. grandiflora (large-flowered). *fl.* large and handsome; calyx tube funnel-shaped, the limb cut into four very long-linear, acuminate segments, of which three are reflexed and the fourth is erect; petals four, linear-subulate. Spring. *l.* ovate or ovate-lanceolate, tapering below, acuminate at the apex, penniveined. *h.* 6ft. Mexico, 1853. (B. M. 4727.)

SEMELE (the name of the mother of Bacchus, after whom the genus was named). SYN. *Amphion.* ORD. *Liliaceæ.* A monotypic genus. The species is an ornamental, greenhouse, evergreen, climbing shrub, thriving in any rich soil. It may be multiplied by division of the roots.

S. androgyna (hermaphrodite). *fl.* small, fascicled, six to twenty in an umbel; perianth greenish-white, with a very short tube and ovate lobes; umbels solitary or few, produced from the sides, or rarely from the face, of the cladodes. April. Cladodes leaf-like, alternate or scattered, solitary at the axils of small, fuscous-membranous scales, ovate or ovate-lanceolate, acuminate, coriaceous, with many slender nerves. Stem branched. Canary Islands, 1713. SYN. *Ruscus androgynus* (B. M. 1898, 3029).

SEMI. This term, used in Latin compounds, signifies half; *e.g.*, Semi-amplexicaul, half-clasping a stem; Semi-hastate, hastate on one side only.

SEMI-LUNAR, SEMI-LUNATE. Resembling a half-moon. The same as Lunate.

SEMINAL. Pertaining to seed.

SEMINIFEROUS. Seed-bearing.

SEMPERVIRENS, SEMPERVIRENT. Evergreen.

SEMPERVIVUM (the old Latin name used by Pliny, and derived from *semper vivo*, to live for ever; alluding to the well-known tenacity of the species). House Leek. Including *Æonium* and *Greenovia.* ORD. *Crassulaceæ.* A genus comprising fifty or more species of greenhouse or hardy, thick, fleshy herbs or sub-shrubs, of variable habit, often stemless, and emitting young plants from the axils, sometimes caulescent and leafy; they inhabit the mountains of Central and Southern Europe, Madeira, the Canary Islands, Asia Minor, Nubia, Abyssinia, and the Western Himalayas. Flowers white, pink, greenish, yellow, or purplish, in paniculate, often dense cymes; calyx cut or parted into six or numerous segments, rarely five-cleft; petals six or numerous, free, or connate at base, and adhering to the filaments, oblong or lanceolate, acute or acuminate; stamens twice as many, or rarely the same number, as the petals, free; filaments filiform. Leaves alternate, thickly fleshy, often revolute. *S. tectorum* is found growing on walls and houses in Britain, but it is not indigenous. Sempervivums succeed in any sandy soil, and may be readily propagated from seeds, or by the young plants which appear round old ones at the base. All the hardy species are admirably adapted for planting on rockwork; and the greenhouse ones, *S. tabulæforme,* for instance, are valuable for succulent and carpet bedding during summer.

Mr. J. G. Baker's admirable classification of the hardy species in cultivation (published in the "Gardeners' Chronicle," n. s., vol. xii.) is appended. By its help, the names of any of the hardy species here described may be readily determined. Mr. Baker says that the following eleven forms "cannot be regarded as more than varieties or sub-species belonging to one variable specific type": *S. arvernense, S. atlanticum, S. Boissieri, S. Boutignyanum, S. calcaratum, S. calcareum,*

Sempervivum—*continued.*

S. glaucum, S. Lamottei, S. Schottii, S. tectorum, and *S. triste.*

Sub-genus I. Sempervivum proper.

Parts of the flowers usually in twelves. Open flower bell-shaped.

RHODANTHA.—Flowers reddish.

Group 1. *Ciliata.* Leaves of the barren rosette glabrous on the face when mature, shortly ciliated on the edges only.
- Leaves large, green or slightly glaucous, with a conspicuous, red-brown tip: *S. arvernense, S. Boissieri, S. Boutignyanum, S. calcaratum, S. tectorum.*
- Leaves large, green or glaucous; red-brown tip none or very obscure: *S. atlanticum, S. glaucum, S. Lamottei, S. Schottii.*
- Leaves large, purplish-brown throughout: *S. triste.*
- Leaves large, very glaucous, with a distinct red-brown tip: *S. calcareum.*
- Leaves small, green, with a distinct red-brown tip: *S. parvulum.*
- Leaves small, glaucous, with a distinct red-brown tip: *S. Greenii.*
- Leaves small, green; red-brown tip none or very obscure: *S. Funckii, S. Verloti.*

Group 2. *Pubescentia.* Leaves of the barren rosette pubescent on the face, as well as ciliated on the edges, not tipped with a tuft of spreading hairs.
- Flower small; stamens two-thirds as long as the petals: *S. assimile.*
- Flower large; stamens half as long as the petals: *S. anomalum, S. flagelliforme, S. montanum.*

Group 3. *Barbatula.* Leaves of the barren rosette strongly ciliated on the edges, and furnished with a tuft of short, straight hairs at the tip.
- Moderately tall: *S. Fauconneti, S. fimbriatum, S. Pomelii.*
- Dwarf: *S. barbatulum.*

Group 4. *Arachnoidea.* Dwarf species, with the tips of the inner leaves of the rosette connected by fine, fleecy threads, like a spider's web.
- Arachnoid threads many: *S. arachnoideum, S. Moggridgei.*
- Arachnoid threads few: *S. Doellianum, S. oligotrichum.*

CHRYSANTHA.—Flowers yellow.

Leaves obovate-cuneate, glabrous on the face: *S. Wulfeni.*
Leaves obovate-cuneate, hairy on the face: *S. Braunii, S. grandiflorum, S. ruthenicum.*
Leaves oblanceolate, very hairy on the face: *S. Pittoni.*

Sub-genus II. Diopogon.

Parts of the flower usually in sixes. Flowers always yellowish. Expanded flower spreading widely.
- Flowers small; petals not fimbriated on the edge and keel: *S. Heuffelii, S. Reginæ-Amaliæ.*
- Flowers large; petals fimbriated on the edge and keel.
  - New rosettes rolled up into round balls: *S. arenarium, S. soboliferum.*
  - New rosettes not rolled up into round balls: *S. hirtum.*

The best-known species are described below. Except where otherwise stated, they are hardy perennials.

S. aizoides (Aizoon-like). *fl.* yellow, corymbose; petals five to eight, spreading. May to July. *l.* scattered, obovate, flat, quite entire, glabrous. Stem erect, branched. *h.* 1ft. Madeira. Greenhouse, evergreen shrub.

S. anomalum (anomalous). *fl.* four to eight in a dense head, all sessile or sub-sessile; corolla bright mauve-purple, 1in. in diameter, very hairy on the outside. June. *l.* thirty to forty to a rosette, oblanceolate, cuspidate, green, with pubescent faces, hairy-edged, the outer ones only tinted with red-brown, ⅜in. to ½in. long. Flowering stem 3in. to 4in. long, its leaves hairy all over and tinted with red-brown, the lowest ½in. to ⅝in. long. Barren rosettes not exceeding 1in. in diameter. A garden species.

S. arachnoideum (cobwebby).* *fl.* nine to twelve-parted, less than 1in. in diameter; petals bright red, lanceolate; filaments bright purple; panicle dense, few-flowered, clothed with slightly fragrant, glandular hairs. June. *l.* about fifty to a rosette, oblong-cuneate, obscurely cuspidate, minutely glandular-pubescent above, the tips connected by long, soft, white hairs; outer leaves reddish-brown at back, ⅜in. long. Flowering stem 3in. to 4in. long, its leaves furnished at tips with tufts of soft hairs. Barren rosettes ½in. to ⅝in. in diameter. Pyrenees and Central Europe, 1699. (B. M. 68; J. F. A. (App.) 42.)

S. a. Laggeri (Lagger's).* A large variety, having fully-developed rosettes 1½in. in diameter. See Fig. 474.

S. arboreum (arborescent). *fl.* golden-yellow, disposed in a loose panicle: petals nine to eleven. March to December. *l.* cuneiform, glabrous, ciliated, spreading, and rosulate at the tops of the branches. Stem arborescent, smooth, branched. *h.* 3ft. to 6ft. Portugal, &c., 1640. Greenhouse, evergreen shrub. (B. R. 99; S. F. G. 473.)

S. a. atropurpureum (dark purple). *l.* blackish-purple. A very effective variety when grown in a sunny position.

Sempervivum—*continued.*

S. a. variegatum (variegated). *l.* green, margined with creamy-white.

S. arenarium (sand-loving).* *fl.* six-parted, many in a dense head, 2in. to 3in. in diameter; petals pale yellow, ½in. to ⅝in. long, distinctly tricuspidate. Summer. *l.* sixty to eighty to a rosette, oblanceolate, acute, not cuspidate, minutely ciliated on the edges; outer ones a little tinted with red-brown, ½in. to ⅔in. long. Flowering stem 6in. to 9in. long, finely pubescent, the crowded leaves strongly ciliated on the margins. Rosettes (and general habit) as in *S. soboliferum.* Tyrol, 1879. SYN. *S. cornutum.*

S. arvernense (Auvergne). *fl.*, petals pale pink, ⅓in. to ½in. long; filaments and anthers red; panicle 2in. to 3in. long and broad, the lower flowers distinctly pedicellate. Summer. *l.* oblanceolate-cuneate, cuspidate, bright pale green, the outer ones 1in. to 1¼in. long, the edges regularly ciliated. Flowering stem 6in. to 8in. long, the lower leaves about 1in. long. Barren rosettes 1½in. to 2½in. in diameter. Central France.

S. assimile (similar). *fl.* ⅔in. in diameter; calyx densely pubescent; petals pale rose, linear. July. *l.* sixty to eighty to a rosette, obovate-cuneate, cuspidate, pale glaucous-green, not red-tipped, shortly ciliated on the margins, minutely pubescent on the face, the outer ones ⅔in. to 1in. long. Flowering stem about 6in. long. Barren rosettes 1½in. to 2in. broad. Tyrol.

S. atlanticum (Atlantic).* *fl.* pale red, 1in. in diameter, twelve-parted; calyx segments twice as long as the tube; panicle short, 3in. to 4in. in diameter. Summer. *l.* oblanceolate-cuneate, cuspidate, pale green, glabrous when mature, scarcely tipped with red-brown, ciliated on the margins, the outer ones 1in. to 1½in. long. Flowering stem nearly 1ft. long, its leaves much tinted with red-brown. Barren rosettes 2in. to 3in. in diameter. Greater Atlas, 1873. (B. M. 6055, under name of *S. tectorum atlanticum.*)

FIG. 474. SEMPERVIVUM ARACHNOIDEUM LAGGERI.

S. aureum (golden).* *fl.* yellow; petals twenty, linear; stamens also twenty; panicle dichotomously-branched, many-flowered. July and August. *l.* obovate-spathulate, with membranously cartilaginous, quite entire margins, glaucous. Stem erect, glabrous. *h.* 1ft. Teneriffe, 1815. Greenhouse, herbaceous sub-shrub. SYNS. *S. Bollii*, *S. calyciforme* (B. R. 892), *Greenovia aurea* (B. M. 4087).

S. barbatulum (slightly bearded). *fl.* nine to twelve-parted; petals rose-red, ½in. long; panicle compact, few-flowered, densely pilose. *l.* oblanceolate, densely pubescent, ciliated on the margins, and furnished with a dense tuft of hairs at the tip, the outer ones about ½in. long. Flowering stem 3in. to 4in. high, its red-tinted, pubescent leaves ½in. to ⅔in. long. Barren rosettes about ⅔in. in diameter. Alps. A well-marked, dwarf-habited plant.

S. Boissieri (Boissier's).* *fl.* 1in. in diameter, twelve to fourteen-parted; petals pale red, very hairy; filaments bright red; panicle about 2in. broad each way, the lower flowers sub-sessile. July. *l.* oblanceolate-cuneate, cuspidate, broadest near the middle, with rather long, brown cilia, hardly at all brown-tinted at top, 1in. to 1¼in. long. Flowering stem 8in. to 9in. long, the leaves red-tinted, closely imbricated. Barren rosettes very dense, 2in. to 2½in. in diameter. 1878. A garden species.

S. Bollii (Boll's). A synonym of *S. aureum.*

Sempervivum—*continued.*

S. Boutignyanum (Boutigny's). *fl.* ⅔in. in diameter, twelve to fourteen-parted; petals pale rose, ⅓in. long, densely gland-ciliated; panicle 2in. to 3in. long and broad, simply branched, many-flowered. Summer. *l.* oblanceolate-cuneate, cuspidate, with a green, glabrous face and a distinct, decurrent, red-brown tip, the outer ones 1in. to 1¼in. long. Flowering stem 6in. to 8in. long, its leaves 1in. or more long. Barren rosettes 2in. to 3in. broad. Pyrenees, 1878.

S. Braunii (Braun's).* *fl.* ten to twelve-parted, ⅔in. to 1in. in diameter; petals dull yellow, unspotted, with a green keel; filaments greenish, obscurely tinted with purple; panicle compact, many-flowered, 2in. to 4in. in diameter. July. *l.* thirty to forty to a rosette, obovate-cuneate, obscurely cuspidate, glandular-pubescent; outer ones obscurely purple-tipped, ⅔in. to 1in. long. Flowering stem 6in. to 9in. long, the upper part shortly pubescent, its leaves 1in. to 1½in. long. Barren rosettes 1½in. to 2in. in diameter. Tyrol, 1874.

S. cæspitosum (tufted). *fl.* yellow, disposed in cymose, dichotomously-branched corymbs; petals seven or eight, spreading. April to September. *l.* oblong-linear, glabrous, stiffly ciliated, marked with brown lines on both surfaces, crowded in a rosulate manner; cauline ones scattered. Stem very short, at length a little branched, leafy at the apex. *h.* 6in. Grand Canary Island, 1815. Greenhouse, evergreen shrub. This plant has been known to remain alive in an herbarium for eighteen months, and to grow when subsequently planted. SYN. *S. ciliatum* (B. M. 1978).

S. calcaratum (spurred).* *fl.* 1in. in diameter; petals dull reddish white, ½in. long; panicle 6in. to 8in. long and broad, the lower branches deeply forked. Summer. *l.* 4in. long, ⅔in. to 1in. broad, rather glaucous, with a distinct red-brown tip, the edges bordered with stiff cilia. Flowering stem above 1ft. long. Barren rosettes 3in. to 4in. in diameter. 1874. A common form in English gardens, where it is variously known as *S. Camollei*, *S. italicum*, *S. juratum*, *S. Royeni*, *S. rusticanum*, and *S. Seguieri.*

S. calcareum (chalk-loving).* *fl.* ten to twelve-parted; corolla ⅔in. in diameter; petals pale red, greenish down the keel, densely ciliated; panicle 3in. to 4in. long and broad, eight to twelve-branched. Summer. *l.* oblanceolate-cuneate, cuspidate, very glaucous, with very distinct red-brown tips, stiffly ciliated on the margins, the outer ones 1in. to 1½in. long. Flowering stem less than 1ft. long, with densely imbricated leaves, 1in. to 1½in. long. Barren rosettes about 2in. in diameter. Calcareous Alps of Dauphiné. SYN. *S. californicum* (of gardens).

S. californicum (Californian). A garden synonym of *S. calcareum.*

S. calyciforme (calyx-formed). A synonym of *S. aureum.*

S. Camollei (Camolle's). A garden synonym of *S. calcaratum.*

S. canariense (Canary Islands).* *fl.* white, pedicellate; petals nine or ten, linear; branches of panicle expanded. June and July. *l.*, radical ones expanded, rosulate, obovate-spathulate, villous, large; cauline ones scattered, ovate. *h.* 1½ft. Canary Islands, 1699. A strong-growing, greenhouse, evergreen shrub.

S. ciliatum (ciliated). A synonym of *S. cæspitosum.*

S. cornutum (horned). A synonym of *S. arenarium.*

S. cruentum (bloody). *fl.* yellow, small, six to eight-parted. May. *l.* cuneate-spathulate, highly glabrous, thick, attenuated into the petiole, papillose on the margins, green and somewhat channelled above, slightly convex beneath. *h.* 1ft. to 2ft. Canary Islands, 1824. Greenhouse, evergreen shrub. (B. R. xxvii. 61, under name of *Æonium cruentum.*)

S. Doellianum (Doell's). *fl.* nine or ten-parted; calyx densely pubescent; petals bright red, lanceolate, ½in. long; filaments bright purple; panicle compact, few-flowered, the larger flowers distinctly pedicellate. June. *l.* forty to fifty to a rosette, oblanceolate, obscurely cuspidate, slightly hairy above, the edges minutely ciliated, the tips of the inner leaves connected by a few cobwebby threads; outer leaves ½in. to ⅔in. long, red-tinted at back. Flowering stem 4in. to 6in. long, its leaves having only an obscure tuft of hairs at the tip. Barren rosettes ½in. to ⅔in. in diameter. Bernese Oberland. SYN. *S. heterotrichum.*

S. Fauconneti (Fauconnet's). *fl.* nine to twelve-parted, nearly 1in. in diameter; petals bright red, lanceolate, glandular on the back and edges; filaments bright purple. Summer. *l.* about fifty to a rosette, oblanceolate, obscurely cuspidate, the surfaces with a few glandular papillæ and streaks of purple, the edges ciliated with deflexed hairs, the outer leaves tinged with red, about ⅔in. long. Flowering stem 6in. to 8in. long, clothed with long hairs. Barren rosettes 1¼in. in diameter. Jura Mountains. Rare in English gardens.

S. fimbriatum (fringed).* *fl.* about twelve-parted, 1in. in diameter; petals bright red, lanceolate, glandular on the back and edges; panicle open, the few branches bearing each six to ten flowers. July. *l.* fifty to sixty to a rosette, oblanceolate, obscurely cuspidate, all green, the edges crowded with deflexed hairs, the outer leaves turning red, and reaching ½in. to ⅔in. long. Flowering stem 6in. to 9in. high, densely glandular-pilose, the lower of the red-tinted leaves 1in. to 1½in. long. Barren rosettes 1in. to 1¼in. in diameter. Alps of Dauphiné.

Sempervivum—*continued.*

S. flagelliforme (whip-like). *fl.* about twelve-parted, six to eight in a dense head, all sessile or nearly so; corolla bright red, above 1in. in diameter, densely glandular-pilose outside. June. *l.* forty to fifty to a rosette, oblanceolate, obscurely cuspidate, minutely downy above, pale green throughout, the edge fringed with short hairs, the outer ones ¾in. long. Flowering stem 3in. to 4in. long, its imbricated leaves tipped with red-brown, the lowest about 1in. long. Barren rosettes 1in. to 1½in. in diameter, with the lax new ones on long, spreading stalks. Native place unknown. Well known in cultivation.

S. Funckii (Funck's).* *fl.* eleven or twelve-parted, nearly 1in. in diameter; petals bright red-purple, densely glandular-pubescent; panicle 2in. to 3in. in diameter, the lower flowers distinctly pedicellate. July. *l.* eighty to a hundred to a rosette, oblanceolate-cuneate, cuspidate, green and glabrous at maturity, not tipped with red-brown, fringed with dense, marginal cilia, the outer ones ½in. to ¾in. long. Flowering stem 6in. to 9in. long, densely pilose, the lower leaves 1in. long. Barren rosettes 1½in. to 2in. in diameter, surrounded by a dense circle of young ones on bright red, decumbent footstalks. Tyrol, &c. (B. H. 1873, 13, under name of *S. Funckii aqualiense.*)

S. glaucum (glaucous). *fl.* 1in. in diameter; petals bright red, more than twice as long as the calyx; filaments deep purple; panicle short, 2in. to 3in. in diameter, the branches few-flowered. Summer. *l.* oblanceolate-cuneate, cuspidate, glabrous, ciliated on the margins, having only a faint red-brown spot at the tip. Flowering stem 6in. to 9in. long, densely hairy above. Barren rosettes 2in. to 3in. in diameter. Simplon Alps.

S. globiferum (globe-bearing). A synonym of *S. grandiflorum.*

S. glutinosum (clammy). *fl.* golden-yellow; petals eight to ten; panicle loosely branched. July and August. *l.* cuneiform, viscid, rather scattered, fringed with adpressed, cartilaginous ciliæ. *h.* 2ft. Madeira, 1777. Greenhouse, evergreen shrub. (B. M. 1963; B. R. 278.)

S. grandiflorum (large-flowered). *fl.* few, very large, ten to twelve-parted, sub-sessile, in a dense head; corolla 1¼in. to 1½in. in diameter; petals pale yellow, with a flush of purple inside at the base; stamens generally bright mauve-purple. Summer. *l.* about forty to a rosette, obovate-cuneate, obscurely cuspidate, pubescent, the very tip reddish-brown; outer ones spreading, ¾in. to 1in. long. Flowering stem 3in. to 4in. high, densely pubescent, its crowded leaves ¾in. to 1in. long. Barren rosettes about 1½in. in diameter, the new ones on decumbent peduncles 1in. to 2in. long. Native country unknown. (B. M. 2115; B. M. 507, under name of *S. globiferum.*)

S. Greenii (Green's). *fl.* eleven or twelve-parted, ½in. in diameter; petals pale red, densely ciliated; filaments bright mauve-purple; panicle 1½in. to 2in. broad, three or four-branched. July. *l.* forty to fifty to a rosette, oblanceolate-cuneate, cuspidate, glaucous, with a distinct brown-red tip, ciliated on the edges, the outer ones ¾in. to 1in. long. Flowering stem 6in. to 12in. long, its hairy, red-tinted leaves ¾in. to 1in. long. Barren rosettes about 1½in. in diameter. Probably the French Alps. 1877.

S. heterotrichum (variably hairy). A synonym of *S. Doellianum.*

S. Heuffelii (Heuffel's).* *fl.* six-parted; calyx bright red-brown when old; petals pale straw-yellow, ⅝in. long, permanently erect, with three small cusps; panicle dense, many-flowered, 2½in. to 3in. in diameter, the lower flowers pedicellate. August. *l.* thirty to forty to a rosette, obovate-cuneate, distinctly cuspidate, the upper third, or even half, tinted with bright red-brown, the margins stiffly ciliated; outer leaves spreading, ¾in. to 1in. long. Flowering stem 6in. to 8in. long, densely pubescent, its close, red-brown leaves ¾in. to 1in. long. Barren rosettes 1½in. to 2in. in diameter. Transylvania and Greece. (R. G. 858, Fig. 2, under name of *S. patens.*)

S. hirtum (hairy). *fl.* usually six-parted; petals pale yellow, ½in. to ¾in. long, lanceolate, the point tricuspidate; panicle few or many-flowered, 1½in. to 4in. in diameter. June. *l.* about fifty to a rosette, obovate-cuneate, finely glandular-pubescent, ciliated down the margins; outer ones faintly tinted with red, ½in. to ¾in. long. Flowering stem 6in. to 9in. long, densely pilose, the crowded leaves pubescent. Barren rosettes 1in. to 1½in. in diameter, not globular. Central Europe, 1804. (A. F. P. 65.)

S. hirtum (hairy). A synonym of *S. soboliferum.*

S. holochrysum (wholly golden). *fl.* golden, glabrous; hypogynous scales broad, truncate, very slightly emarginate; panicle 9in. long, very dense, pyramidal. December to February. *l.* dark green, spathulate, obtuse, glabrous, shining, cartilaginously ciliated, attenuated-tetragonal at base, red-margined at apex. Stem shrubby, erect. Teneriffe, 1816. Greenhouse. SYN. *S. urbicum* (B. R. 1741).

S. italicum (Italian). A garden synonym of *S. calcaratum.*

S. juratum (sworn). A garden synonym of *S. calcaratum.*

S. Lamottei (Lamotte's).* *fl.* 1in. in diameter, twelve to sixteen-parted; calyx densely pilose; petals pale pink; filaments bright purple; panicle like that of *S. tectorum.* Summer. *l.* obovate-cuneate, cuspidate, glabrous on the faces; outer ones 1¼in. to 1½in. long, with stiff marginal cilia, and very faintly red-brown tinted at the tip. Flowering stem often above 1ft. long. Barren rosettes 3in. to 4in. in diameter. Central France.

S. Moggridgei (Moggridge's).* *fl.* red, cymose, ¾in. in diameter; calyx cup-shaped, glandular-pubescent; petals twice as long as the sepals, spreading. September. *l.* ¾in. long, elongate-cuneate or oblanceolate, green, glabrous, with minutely ciliated margins and acute tips; lower cauline ones pale green and reddish. Flowering stem 9in. high, stout, leafy. Rosettes 2in. in diameter, of about a hundred leaves. Alps, 1881. (B. M. 6610.)

S. monanthes (one-flowered). *fl.* purplish, small; petals six to nine, scarcely longer than the calyx; scales obcordate; peduncles naked, generally one, rarely few, flowered. July to September. *l.* terete, clavate, glabrous, crowded in a rosulate manner. *h.* 1in. to 2in. Canary Islands, 1777. A very dwarf, greenhouse, evergreen shrub. (B. M. 93.)

S. montanum (mountain).* *fl.* twelve to fourteen-parted; petals bright mauve-purple, ½in. to ⅝in. long, linear, acuminate; panicle very dense, ½in. to 2in. in diameter, the branches very pilose, and the lowest flowers nearly sessile. June. *l.* tightly packed, sixty to eighty to a rosette, oblanceolate-cuneate, cuspidate, entirely green, slightly pilose on the face, regularly ciliated on the margins, the outer ones ¾in. to 1in. long. Flowering stem about 6in. long, the densely imbricated leaves tipped with red-brown, the lower ones 1in. to 1½in. long. Barren rosettes 1½in. to 1¾in. in diameter. Alps and Pyrenees. (J. F. A. v. 41.)

S. oligotrichum (few-haired). *fl.* about ten-parted, ¾in. in diameter, in a dense head; petals bright red; filaments bright purple. Summer. *l.* thirty to forty to a rosette, oblanceolate, obscurely cuspidate, minutely pubescent, the edges minutely ciliated; inner ones connected by a few cobwebby threads, which nearly or quite disappear at flowering time; outer ones about ½in. long. Flowering stem 2in. to 4in. long, its leaves bright red and densely pubescent. Barren rosettes about 1in. in diameter. Tyrol.

S. Paivæ (Baron Paiva's). *fl.* green, scentless, ¾in. broad; petals erecto-patent, acuminated, with recurved and spirally twisted tips. August. *l.* highly glaucous, 1in. to 2½in. long, ½in. to 1in. broad, those of the flowering branches thick and fleshy, of the barren ones thinner, and finely serrulate-ciliated. Canary Islands, 1866. A low, straggling, greenhouse, evergreen shrub. (B. M. 5593.)

S. parvulum (rather small). *fl.* ¾in. in diameter; petals pale red; panicle short, corymbose, about 2in. in diameter. July. *l.* oblanceolate-cuneate, cuspidate, with a distinct, red-brown tip, minutely but stiffly ciliated on the edges, the outer ones about 1in. long. Flowering stem 6in. to 12in. long, very pilose, its leaves red-brown, the lowest ¾in. to 1in. long. Barren rosettes 1in. to 1½in. in diameter. Alps of Dauphiné, 1878. A rare form in cultivation.

S. Pittoni (Pitton's). *fl.* nine to twelve-parted, ten to twenty in a dense head, 1½in. to 2in. in diameter, densely pilose; petals primrose-yellow, whitish inside towards the base, ⅜in. long, lanceolate; filaments pale. July. *l.* sixty to eighty to a fully-developed barren rosette, oblanceolate, tipped with claret-purple, densely and persistently pubescent, the tip deltoid-cuspidate; outer ones about ¾in. long. Flowering stem 4in. to 6in. long, densely pilose, its leaves tipped with claret-purple. Barren rosettes 1in. to 1½in. in diameter, the young ones sessile. Alps of Styria.

S. Pomelii (Pomel's).* *fl.* ten to twelve-parted; corolla bright rose-red, about 1in. in diameter; petals widely spreading; panicle 3in. to 4in. in diameter, its simple branches bearing six to twelve flowers. July. *l.* fifty to sixty to a rosette, oblanceolate, distinctly cuspidate, with a few hairs on both surfaces, the outer ones tinged with red, ¾in. to 1in. long. Flowering stem 6in. to 9in. long, densely pilose, its hairy leaves much imbricated, the lower ones 1in. to 1¼in. long. Barren rosettes 1½in. to 1¾in. in diameter. Auvergne.

S. Reginæ-Amaliæ (Queen Amalia's of Greece). *fl.* six or seven-parted; petals pale yellow, ligulate, obtuse; panicle dense, many-flowered, capitate, the lowest flowers shortly pedicellate. Summer. *l.* a hundred or more to a rosette, obovate-cuneate, distinctly cuspidate, bright purplish-brown in the upper half, the edges ciliated; outer ones spreading, 1in. to 1¼in. long. Flowering stem 6in. high, densely pubescent, the crowded leaves brown. Barren rosettes about 3in. in diameter. Greece.

S. Royeni (Royen's). A garden synonym of *S. calcaratum.*

S. rusticanum (rustic). A garden synonym of *S. calcaratum.*

S. ruthenicum (Russian). *fl.* about twelve-parted; petals pale yellow, linear, not more than ¾in. long; filaments finally bright mauve-purple; panicle short and compact, densely pubescent. Summer. *l.* forty to fifty to a rosette, obovate-cuneate, cuspidate, slightly glandular-pubescent, ciliated at edges with short, decurved hairs; outer ones tinted at back, ¾in. to 1in. long. Flowering stem 6in. to 12in. long, shortly pubescent upwards. Barren rosettes 1½in. in diameter. South-east Russia, &c.

S. Schottii (Schott's). *l.* twelve to fourteen-parted; lower ones densely sessile; petals pale red, with a deeper keel, twice as long as the calyx; filaments deep purple; panicle short and compact, 2in. to 3in. in diameter. Summer. *l.* oblanceolate-cuneate, cuspidate, glabrous, ciliated on the margins, scarcely tipped with red-brown, the outer ones 1in. to 1¼in. long. Flowering stem nearly 1ft. long, its oblong-lanceolate, red-tinted leaves 1in. to 1½in. long. Barren rosettes 2in. to 3in. in diameter. Tyrol, 1874.

Sempervivum—*continued.*

S. Seguieri (Seguier's). A garden synonym of *S. calcaratum.*

S. Smithii (Smith's). *fl.* pale yellow, sessile; petals twelve, oval-oblong, spreading; branches of the panicle revolute at the points, bearing flowers on the upper side. July and August. *l.* scattered, obovate, acuminate, flat, concave, slightly spotted. Stem erect, hispid. *h.* 1ft. Canary Islands, 1815. Greenhouse, evergreen shrub. (B. M. 1980.)

S. soboliferum (sobole-bearing).* Hen-and-Chickens Houseleek. *fl.* six or seven-parted; petals pale yellow, lanceolate, ½in. long, obscurely tricuspidate; panicle short, dense, many-flowered, 3in. to 4in. in diameter, the lower flowers distinctly pedicellate. Summer. *l.* sixty to eighty to a rosette, obovate-cuneate, obscurely cuspidate, minutely ciliated on the edges; outer ones tinted with bright red-brown, ¾in. to 1in. long. Flowering stem 6in. to 9in. long, very robust, quite hidden by the leaves. Barren rosettes globose, 1in. to 1½in. in diameter; the copious new sessile ones attached to the parent only by a slender thread. Austria. A well-known garden plant. (B. M. 1457; J. F. A. 12, under name of *S. hirtum.*)

S. stellatum (star-like). *fl.* golden-yellow, panicled; petals six to eight, spreading; scales palmate, with subulate lobes. July and August. *l.* scattered, oblong, spathulately cuneiform, obtuse, villous. Stem erect, branched, puberulous. *h.* 6in. Madeira, 1790. Greenhouse annual. (B. M. 1809, under name of *S. villosum.*)

S. tabulæforme (table-formed).* *fl.* very pale sulphur-coloured; petals ten to twelve, linear-lanceolate; glands minute, pedunculate. June and July. *l.* spathulate, flat, ciliated, attenuated at base, crowded at the top of the stem, and forming a flat, rosulate disk, in consequence of being so closely imbricated over each other. *h.* 1ft. Madeira, 1817. Greenhouse, evergreen shrub.

S. tectorum (roof-loving). Bullock's Eye; Common Houseleek; Jupiter's Beard; Sengreen. *fl.* ¾in. to 1in. in diameter; petals linear, pale red, keeled with deeper red; filaments bright purple; panicle 5in. to 6in. long, with ten or twelve scorpioid branches. July. *l.* fifty to sixty to a rosette, obovate-cuneate, cuspidate, 1½in. to 2in., or finally 3in., long, pale green, with a distinct red-brown tip, the edges ciliated. Flowering stem about 1ft. long, densely pilose. Barren rosettes 3in. to 4in. in diameter. Britain (but not indigenous). (Sy. En. B. 538.)

S. t. atlanticum (Atlantic). *See* **S. atlanticum.**

S. tortuosum (twisted). *fl.* yellow; petals seven or eight, spreading; scales two-lobed. July and August. *l.* obovate-spathulate, scattered, rather convex beneath, nearly or quite 1in. long and ½in. broad. Stem erect, branched. *h.* 6in. to 9in. Canary Islands, 1779. Greenhouse, evergreen shrub. (B. M. 296.)

S. triste (sad). *fl.*, calyx deeply tinted with red-brown; corolla bright red, 1in. in diameter; panicle 6in. long, 3in. to 4in. in diameter, the larger flowers distinctly pedicellate. Summer. *l.* oblanceolate-cuneate, cuspidate, glabrous, the margins shortly ciliated, the whole upper part, both back and face, suffused with red-brown. Flowering stem as robust as in *S. tectorum,* its leaves strongly tinted with red-brown, the lower ones 2in. to 3in. long. Barren rosettes 2in. to 3in. in diameter. A rare garden form.

S. urbicum (city), of Lindley. A synonym of *S. holochrysum.*

S. Verloti (Verlot's). *fl.* twelve to fourteen-parted, ¾in. to ⅞in. in diameter; petals rose-red, densely ciliated on the back and edge; filaments bright purple; panicle 3in. to 4in. in diameter, each of the simple branches eight to twelve-flowered. July. *l.* about fifty to a rosette, oblanceolate-cuneate, cuspidate, faintly glaucous, only red-brown at the extreme tip, ciliated on the margins, the outer ones ¾in. to 1in. long. Flowering stems 6in. to 9in. long, the lowest leaves about 1in. long. Barren rosettes 1½in. to 2in. in diameter. Alps of Dauphiné.

S. villosum (villous). *fl.* yellow, with fringed scales. June and July. *l.* obovate, crowded, gibbous beneath, villous, five lines long, three lines broad. Stem rather erect, twisted. *h.* 6in. to 9in. Canary Islands, 1777. Greenhouse, evergreen shrub. (B. R. 1553.)

S. Wulfeni (Wulfen's).* *fl.* twelve to fourteen-parted; petals pale yellow, ½in. long, linear; filaments bright mauve-purple; panicle short, dense, 2in. to 3in. in diameter, densely pilose. Summer. *l.* about fifty to a rosette, obovate-cuneate, cuspidate, slightly glaucous, faintly tinted with red-brown at the tip, the edges ciliated; outer ones ¾in. to 1in. long. Flowering stem 6in. to 9in. long, densely pilose upwards, its lanceolate leaves 1in. to 1½in. long. Barren rosettes 1½in. to 2in. in diameter. Central Europe. Habit of *S. tectorum.* (J. F. A. sup. 40, under name of *S. globiferum.*)

S. Youngianum (Young's). *fl.* yellow. June. *l.* sub-cartilaginous, thick, shining green, obcordate-spathulate, sub-tetragonal at base, obsoletely mucronate at apex, shortly ciliated on the margins. Stem thick. *h.* 3ft. Canary Islands, 1843. Greenhouse, evergreen shrub. (B. R. xxx. 35, under name of *Æonium Youngianum.*)

SENACIA. Included under *Pittosporum.*

SENARY. In sixes.

SENECA, SENEGA, or SENEKA SNAKE-ROOT. *See* **Polygala Senega.**

SENECIO (the old Latin name used by Pliny, and derived from *senex,* an old man; alluding to the usually white, hair-like pappus). Groundsel; Ragweed. Including *Adenotrichia, Brachyrhynchos, Cacalia, Cineraria* (in part), *Farfugium, Gynoxys* (in part), *Jacobæa, Kleinia* (of Haworth), *Ligularia, Pericallis, Senecillis,* and *Syneilesis* (*Cacalia, Cineraria,* and *Ligularia,* are, however, for garden purposes, kept distinct in this work). ORD. *Compositæ.* A vast genus—probably the most extensive in the vegetable kingdom—comprising, according to Bentham and Hooker, nearly 900 species of stove, greenhouse, or hardy, annual, biennial, or perennial herbs, sub-shrubs, or shrubs, rarely arborescent, dispersed over the whole globe, but most numerous in temperate or mountainous regions. Flower-heads radiate-heterogamous or discoid-homogamous, solitary or corymbose, very rarely disposed in pyramidal panicles, sub-racemose or sessile at the sides of the branches; involucral bracts in one series, with sometimes a few smaller ones at the base, at length often reflexed; receptacle flat or slightly convex; ray florets, when present, variously coloured, one-seriate, ligulate; disk yellow, whitish, or rarely purplish or violet; achenes glabrous or slightly villous, of variable form and size. Leaves alternate or radical, entire, toothed, lobed, or variously (often pinnately) dissected. The genus is represented in Britain by nine species (two of which, however, are not indigenous, but have become naturalised), including the Ragweed or Ragwort (*S. Jacobæa*) and Groundsel (*S. vulgaris*). South Africa is richest in species in the Old World, and the Andean region in the New. A representative selection of the plants best known to horticulturists is given below. Senecios are easy to grow; they succeed in almost any loamy soil. The annuals may readily be increased by seeds, which, in many instances, ripen in abundance. Other representatives of the genus may be propagated by seeds, by divisions, or by cuttings both of the shoots and roots. *See also* **Cacalia, Cineraria,** and **Ligularia.**

S. aconitifolius (Aconite-leaved). *fl.-heads* pinkish-red, small, discoid, disposed in loose corymbs. *l.* on long petioles, palmately parted; lobes several, with a few strong teeth. Stem tall, striated. Amur, North China, 1877. A hardy perennial, of little beauty. SYN. *Syneilesis aconitifolia* (R. G. 887).

S. Adenotrichia (Adenotrichia). *fl.-heads* yellow; involucre campanulate, biseriate, the outer scales linear-subulate; ray florets twelve to fifteen. May. *l.* auriculate-amplexicaul, oblong, pinnatifid, unequally toothed. Branches nearly naked at apex, dichotomously sub-corymbose. *h.* 2ft. Chili, 1826. Greenhouse, glandular-pilose sub-shrub. (B. R. 1190, under name of *Adenotrichia amplexicaulis.*)

S. ampullaceus (bottle-shaped). *fl.-heads* yellow, about 1in. in diameter, in a corymbose panicle; involucre at length bottle-shaped; ray florets few, spreading. July. *l.* oblong, obtuse, fleshy, deeply toothed, sub-cordate at base, semi-amplexicaul. Stems striated, branched above. *h.* 2ft. Texas, 1834. An erect, highly glabrous, half-hardy annual. (B. M. 3487.)

S. Anteuphorbium (so named "because of its being a reputed antidote against the acrid poison of the Cape *Euphorbium,*" Hooker). *fl.-heads* yellow, with a rose tinge, 1in. long, cylindric, erect, solitary, axillary; involucral bracts numerous; florets all tubular, scarcely exceeding the involucre; peduncles very stout, with a few scattered bracts. January. *l.* about 1in. long, erect, oblong or linear-oblong, acute or obtuse, fleshy, entire, on very short petioles. Stem thick, fleshy, cylindric; branches ½in. to 1in. in diameter, constricted at base. *h.* 3ft. to 4ft. South Africa, &c., 1596. Greenhouse, succulent shrub. (B. M. 6099.)

S. argenteus (silvery).* *fl.-heads* yellowish, solitary; involucre campanulate, scarcely bracteolate, with about twenty scales; ray florets about twelve, linear-oblong. Summer. *l.* linear, entire, obtuse; upper ones few, acute. Branches adpressedly silvery-tomentose. *h.* 1ft. to 2ft. Chili. Greenhouse under-shrub.

S. chordifolia (cord-leaved).* *fl.-heads* yellow, very few, ⅜in. long, narrow; involucral leaflets about sixteen, with a few bristle-shaped bracteoles at base; pappus white; cymes very slender, 6in. to 10in. long, sparingly forked, the branches erect. July. *l.* 7in. to 10in. long, ¼in. in diameter, acute, cylindric, but flattened above towards the base. Stem slightly branched. *h.* 1ft. South Africa, 1862. A greenhouse, glabrous, fleshy sub-shrub. (B. M. 6216.)

S. concolor (one-coloured). *fl.-heads* 1¼in. in diameter; ray florets mauve-purple; disk white; anthers purple; corymbs three to five-headed. Summer. *l.* glabrous; radical ones narrow-oblanceolate, toothed; cauline ones amplexicaul, broadly linear

Senecio—*continued.*

Stem 1ft. to 2ft. high, loosely branched above. South Africa, 1882. A pretty, half-hardy perennial. (B. M. 6713.)

S. diversifolius pinnatifidus (variable-leaved, pinnatifid). *fl.-heads* purple, discoid; peduncles elongated, simple or branched, scaly. June. *l.* lanceolate-oblong, acute or acuminate, deeply pinnatifid; lobes in many pairs, toothed or incised, the uppermost two or three pairs confluent in a pinnatifid, terminal lobe. Stem erect, leafy below. *h.* 2ft. South Africa. Half-hardy perennial. SYN. *Brachyrhynchos albicaulis.*

S. Doria (Doria).* *fl.-heads* yellow; accessory involucral scales linear-subulate; ray florets five or six; corymbs compound, loosely sub-paniculate. August. *l.* toothed, rather thick, sub-glaucescent; radical ones petiolate, oval-oblong; cauline ones slightly amplexicaul, sub-decurrent, oblong-lanceolate. Stems erect, striated, glabrous. *h.* 4ft. South Europe, 1570. Hardy perennial. (J. F. A. 185.)

S. Doronicum (Leopard's Bane).* *fl.-heads* yellow, 2in. in diameter, solitary or few; involucre bracteate, campanulate, the scales lanceolate, acuminate; ray florets twelve to twenty-five, flat; achenes glabrous, striated. Summer. *l.* rather thick, toothed; radical ones lanceolate, elliptic, or ovate-cordate, on short or long petioles, sub-elliptic or obtuse. *h.* 1ft. South Europe, 1705. Hardy perennial. (J. F. A. v. 45.)

S. D. hosmariensis (Beni-Hosmar). *fl.-heads* rich yellow, on a scape 3in. to 5in. high. *l.*, radical ones 1in. to 1½in. long, ovate, elliptic-ovate, or ovate-cordate, acute or obtuse, irregularly toothed, dark green, rugose, and glabrous above, greenish-white beneath; cauline ones few, narrow. Beni-Hosmar, Morocco, 1874. A pretty rockwork plant. (B. M. 6101.)

S. elæagnifolius (Elæagnus-leaved). *fl.-heads* yellow, ½in. long, campanulate, rayless; panicle terminal, stout, branched, buff-woolly. *l.* ½in. to 1in. long, on stout petioles, obovate or lanceolate-oblong, obtuse, entire; branches buff-tomentose. *h.* 6ft. to 8ft. New Zealand. Greenhouse shrub.

S. elegans (elegant).* *fl.-heads* radiate, showy, on long, scaly pedicels; involucre calycled with many ciliated, black-tipped bracteoles; ray florets purple; disk yellow. *l.* 1½in. to 3in. long, ear-clasping at base, petioled, extremely varied in shape and degree of incision. Stems erect, 1ft. to 2ft. high, or diffuse. South Africa. A viscous-pubescent, half-hardy annual or biennial. A variety with double flowers is the well-known "American Groundsel" of our gardens.

S. e. erectus (erect). *fl.-heads*, involucral scales glabrous. *l.* frequently pinnate or bipinnatipartite. Stem erect, slender. (B. M. 238, under name of *S. elegans.*)

S. fulgens (brilliant). *fl.-heads* bright orange-vermilion, erect or inclined, 1½in. long; involucre terete, the leaflets eight to ten, acute; florets slender, tubular, with linear-oblong lobes; peduncles 4in. to 8in. long, erect, loosely clothed with succulent bracts. May. *l.* succulent, 4in. to 6in. long, on short, broad petioles, obovate-oblong, sub-acute, remotely serrated, smooth. Stems branched, terete. *h.* 2ft. to 3ft. Natal, 1866. A greenhouse, succulent sub-shrub, covered with pale green, glaucous bloom. (B. M. 5590, under name of *Kleinia fulgens.*)

S. Ghiesbreghtii (Ghiesbreght's). A synonym of *S. grandifolius.*

S. glastifolius (woad-leaved). *fl.-heads* purple, radiate; involucre amply calycled with subulate bracteoles; panicle many-headed, loosely corymbose. June. *l.* oblong or oblong-lanceolate, 1in. to 3in. long, acute, coarsely and unequally toothed, half-amplexicaul, the lower ones more or less decurrent. Stems erect, branching. *h.* 4ft. South Africa, 1826. Greenhouse sub-shrub. (B. R. 1342, under name of *S. lilacinus.*)

S. grandiflorus (large-flowered). *fl.-heads* in a loosely corymbose panicle; involucre amply calycled with many subulate, spreading bracteoles; ray florets purple; disk yellow. August. *l.*, cauline ones sessile, half-amplexicaul, 3in. to 6in. long, pinnatipartite; lobes several on each side, linear, acuminate. Stems 4ft. to 5ft. high, naked at top. South Africa, 1774. Greenhouse perennial. (B. R. 901, under name of *S. venustus.*)

S. grandifolius (large-leaved). *fl.-heads* yellow, in a terminal corymb. *l.* deep green, about 1ft. long, coarsely toothed or lobed. Stems deep purple, curiously spotted or warted. *h.* 3ft. to 4ft. Mexico. A half-hardy shrub, useful for massing or isolating on the lawn as a foliage plant. SYN. *S. Ghiesbreghtii.* (R. G. 296.)

S. Haworthii (Haworth's). *fl.-heads* orange-yellow, solitary, erect, 1¼in. long, cylindric, discoid; involucral scales appressed, shorter than the florets; peduncle terminal, 2in. long. July. *l.* 1in. to 2in. long, cylindric or ellipsoid, acute, narrowed into short petioles. Stem erect; branches cylindric. South Africa, 1873. A small, succulent, greenhouse under-shrub, clothed with soft, snow-white wool. (B. M. 6063.)

S. incanus (hoary). *fl.-heads* yellow, disposed in a simple, somewhat crowded corymb; involucre about half as long as the florets; calyces few. August. *l.* bright silvery; lower ones obovate, with incised lobes, the upper ones overlapping; upper leaves oblong, with separate, linear leaflets. Stems tufted. *h.* 3in. to 6in. Alps. A pretty and compact, hardy perennial, altogether white with adpressed hairs.

S. Kæmpferi aureo-maculata (Kæmpfer's gold-spotted). A synonym of *Ligularia Kæmpferi aureo-maculata.*

S. laciniatus (torn). "*l.* slender, pale green, finely cut into long, narrow lobes, drooping gracefully from the upper part of the slender, half-woody stems. This half-hardy sub-shrub is one of the most elegant of all foliage plants. It should not be allowed to flower" ("Thompson's Gardeners' Assistant").

S. Lagopus (hare's-foot). *fl.-heads* bright yellow, radiate, ½in. to 1in. in diameter, on slender pedicels; pappus hairs white; scape 2in. to 6in. high, branched above, two to eight-headed. Summer. *l.* 1in. to 4in. long, on short, stout, villous petioles, broadly cordate-oblong, rounded at the tip, white-woolly beneath, wrinkled and covered with bristles above. Crown of the root loaded with matted hairs. New Zealand, 1882. Hardy, perennial, rockwork plant.

S. macroglossus (large-tongued).* Cape Ivy. *fl.-heads* on long, axillary peduncles; ray florets eight to twelve, pale yellow, forming a limb about 3in. across, multiseriate. Summer. *l.* petiolate, hastate, with acuminate basal lobes, or cordate, acute or acuminate, entire, or with one or two broad teeth or lobules on each side. Stems smooth and glossy. South Africa, 1875. A greenhouse, evergreen, soft-wooded climber, with Ivy-like leaves; it is well suited for training to a rafter. (B. M. 6149; F. d. S. 2188; G. C. n. s., iii. p. 749.)

S. mikanioides (Mikania-like).* German Ivy. *fl.-heads* yellow, discoid; involucre sparingly calycled, of eight or nine narrow scales; corymb generally much-branched. December. *l.* somewhat fleshy, petiolate, sharply five to seven-angled or lobed, hastate or cordate at base, the lobes deltoid or obsolete, with broad, shallow interspaces; petioles 1in. to 1½in. long. *h.* several feet. South Africa, 1855. A much-branched, climbing, greenhouse sub-shrub, forming an admirable window creeper. SYN. *Mikania senecioides* (of gardens).

S. multibracteatus (many-bracted). *fl.-heads* sub-corymbose, on very long, copiously scaly pedicels; involucre of many dark-tipped, glabrous scales, amply calycled with many imbricating bracts; ray florets purple; disk yellow. Summer. *l.* 2in. to 2½in. long; cauline ones sessile, not auricled, lanceolate, coarsely few-toothed, tapering at base; rameal ones stem-clasping, coarsely toothed at base. Stems 1ft. to 1½ft. high, branched above. South Africa, 1872. A sparsely pubescent, greenhouse annual. (Ref. B. 251.)

S. præcox (early). *fl.-heads* yellow, appearing before the leaves, on elongated pedicels; involucre cylindrical, eight to ten-leafleted, almost ebracteate; ray florets five, spreading; corymbs branched, seven or eight-headed. June. *l.* petiolate, cordate, acute, five to seven-angled or lobed, membranous. Stem fleshy-shrubby, branched, terete. *h.* 2ft. Mexico. A glabrous, greenhouse subshrub. (B. M. 4803.)

S. pteroneura (wing-nerved). *fl.-heads* pale straw-colour, solitary, or two or three at the tips of the branches, erect, cylindric, scarcely ¾in. long; involucral scales brownish-red about the middle; florets narrow, slender; peduncles very stout, longer than the involucre. November. *l.* only developed on very young shoots, elliptic or lanceolate, ¼in. to ¾in. long. Stems 4ft. to 8ft. high, loose, nearly erect; branches ¾in. in diameter, nearly straight, obtuse. Morocco, 1872. A highly glabrous, glaucous, fleshy-shrubby, greenhouse plant. (B. M. 5945.)

FIG. 475. SENECIO PULCHER.

S. pulcher (pretty).* *fl.-heads* large, corymbose; involucre very broadly campanulate, calycled with pubescent-woolly, obtuse

Senecio—*continued.*

leaflets; ray florets nearly twenty, purple, longer than the yellow disk. Summer and autumn. *l.* oblong-lanceolate, crenate-toothed; radical ones petiolate; cauline ones sessile; upper ones half-amplexicaul, and slightly decurrent. Stem simple or branched. *h.* 1ft. to 2ft. Uruguay, 1872. A pretty, cobwebby-tomentose, hardy perennial. See Fig. 475. (B. M. 5959; R. H. 1877, p. 94.)

S. pyramidatus (pyramidal).* *fl.-heads* yellow, many, ¾in. in diameter, exclusive of the ten or twelve broad, spreading ray florets, disposed in a long, thyrsoid raceme, 6in. to 12in. long; involucre sub-calyculate, campanulate, woolly, of ten to twelve very broad scales. Summer. *l.* sessile, sub-terete, fleshy, acute, 3in. long, two to three lines wide, glabrous or cobwebby. Stem shrubby, fleshy, erect, simple, closely leafy below, sparsely so above, tomentose. *h.* about 2ft. South Africa, 1863. A very fine, greenhouse species. (B. M. 5396.)

S. scaposus caulescens (scaped, caulescent). *fl.-heads* yellow; involucre cobwebby, scarcely calycled; ray florets about twelve; peduncles scape-like, 1ft. to 1½ft. long, naked or sparsely scaly, usually bearing three to five long-pedicelled heads. August. *l.* 2in. to 3in. long, crowded at the apex of the stem or branches, fleshy, broadly linear, very obtuse, terete, the young ones cobwebby, the older ones glabrous. Stem fleshy-shrubby, 1ft. high, branched. South Africa, 1843. Greenhouse. (B. M. 4011, under name of *S. calamifolius.*)

S. Skinneri (Skinner's). *fl.-heads* yellowish, fragrant, in terminal, corymbose racemes; ray florets few; bracteoles four to six, much spreading, subulate. June. *l.* alternate, rather long-petiolate, ovate or ovate-lanceolate, acute, slightly fleshy, entire, indistinctly veined. *h.* 3ft. Guatemala, 1840. A pretty, highly glabrous, greenhouse, perennial climber, with tuberous roots. (B. M. 4511; L. & P. F. G. i. p. 77, f. 54; and L. J. F. 18, under name of *Gynoxys fragrans.*)

S. speciosus (showy).* *fl.-heads* bright purple, 1½in. in diameter, long-peduncled, in spreading corymbs; involucre densely glandular-hairy; ray florets six to twenty, narrow-linear; scape 1ft. or less high, with alternate, rather distant, erect leaves. July. *l.* 4in. to 7in. long, obovate, lanceolate, or narrowly linear-spathulate, crenately toothed or sinuately lobed, rarely sub-pinnatifid, sub-acute or obtuse, glandular-hairy. South Africa, 1789. Greenhouse perennial. (B. M. 6488; B. R. 41; L. B. C. 1113; G. C. n. s., xiv. p. 149; R. G. 1881, p. 310; A. B. R. 291, under name of *S. pseudo-china.*)

S. stenocephala comosa (narrow-headed, tufted). *fl.-heads* yellow, with three ray florets, disposed in a dense, narrow-oblong spike. Summer. *l.*, radical ones on long petioles, broadly ovate-sagittate, acuminate. Stem 2ft. high. Japan, 1881. A striking and ornamental, hardy perennial. (G. C. n. s., xvi. p. 301.) The flower-heads in the typical form possess but one ray floret each.

S. sub-scandens (somewhat climbing). *fl.-heads* ½in. long, cylindric; involucral bracts five, red-tipped; florets about ten, dark ochreous-yellow, exceeding the involucre; pappus snow-white; cymes axillary and terminal, long-peduncled, much-branched. January. *l.* 5in. to 9in. long, pink-veined, pinnatiparted; lateral lobes two to six pairs, ovate or orbicular, distant, adnate, coarsely sinuate-toothed; terminal one deltoid, deeply cordate at base. Stems and branches cylindric, succulent. South Africa, 1873. A tall, herbaceous climber. (B. M. 6363.)

S. uniflorus (one-flowered). *fl.-heads* yellow, few on long stalks, or solitary; involucre turbinate, half as long as the disk; ray florets expanding. July. *l.*, lower ones divided, stalked, oblong; upper ones sessile, linear, entire. *h.* 3in. Alps of Europe, 1785. A pretty, cano-tomentose, hardy perennial, allied to *S. incanus.* (A. F. P. 17.)

SENEGA. Included under **Polygala** (which *see*).

SENGREEN. A popular name for *Saxifraga nivalis* and *Sempervivum tectorum.*

SENNA. The leaves of *Cassia acutifolia*, *C. angustifolia*, and other allied species.

SENNA, BLADDER. *See* **Colutea.**

SENNA, SCORPION. *See* **Coronilla Emerus.**

SENSITIVE BRIAR. *See* **Schrankia uncinata.**

SENSITIVE PLANT. *See* **Mimosa.**

SEPAL. One of the parts that, together, form the calyx, or outermost whorl of a flower. The Sepals are usually green, and unlike the petals (*e.g.*, in the Rose), but may resemble them (*e.g.*, in the Tulip). They may be free from one another, but often are more or less closely united by their edges to form a tube or cup. Their chief use is to protect the more delicate inner organs of the flowers from injury while growing.

SEPALINE, SEPALOUS. Relating to sepals.

SEPALODY. A name used to indicate the change of petals, &c., into sepals or sepaloid organs.

SEPALOID. Resembling a sepal.

SEPTAS (of Linnæus). Included under *Crassula.*

SEPTAS (of Loureiro). A synonym of *Herpestis.*

SEPTATE. Separated by a partition or septum.

SEPTFOIL. A common name for *Potentilla Tormentilla.*

SEPTICIDAL. When a capsule dehisces through the dissepiments or lines of junction.

SEPTIFEROUS. Partition-bearing.

SEPTIFRAGAL. "A mode of dehiscing, in which the backs of the carpels separate from the dissepiments, whether formed by their sides or by expansions of the placenta" (Lindley).

SEPTORIA. *See* **Sphæropsideæ.**

SEPTUM. A partition.

SEQUOIA (derivation obscure, but it has been suggested that it is "a modification of *See-qua-yah*, the name of a celebrated Cherokee chief," Hemsley). SYNS. *Gigantabies, Washingtonia, Wellingtonia.* ORD. *Coniferæ.* A small genus (two species) of gigantic, hardy, evergreen, densely branched trees, natives of California. Flowers monœcious, the males in the upper axils or at the tips of the branchlets, solitary; female catkins terminal, ovoid or oblong. Leaves alternate, spirally affixed, in *S. sempervirens* often sub-lanceolate and distichously spreading, in *S. gigantea* frequently much shorter, more obtuse, and appressedly imbricated, but leaves of both forms are sometimes observable in each species. Cones ½in. to 1½in. long. "The timber is of a beautiful red colour, fine and close-grained, but light and brittle, and never attacked by insects. It is the Californian Redwood or Bastard-tree of the settlers" (Gordon, "The Pinetum"). The following interesting particulars respecting the dimensions of these trees in a grove in Yo Semite Valley, are gleaned from the "Gardeners' Chronicle," n. s., x. 240: "The grove contains between ninety and a hundred big specimens of the *Sequoia gigantea*, growing out of the thick forest. The 'Father of the Forest,' a great prostrate trunk, measures 435ft. in length, and 110ft. in circumference. He must have been much longer when living. Along the inside of the fallen trunk is a tunnel 35ft. long, and, in places, 8ft. to 10ft. high. The 'Mother of the Forest,' standing at the farther end of the grove, is 327ft. high, and 90ft. in circumference. She stands quite dead and bare, having suffered from the ravages of fire, and is entirely barkless from top to bottom. A great living monster is the 'Pioneer's Cabin,' probably so called from a recess in the lower part of the trunk big enough to hold a large family party at breakfast. The circumference of this tree 5ft. from the ground is 92ft. by our own measuring. Perhaps the most beautiful of the trees in the grove are three named 'The Three Graces.' They stand only a few feet apart, and, with their branches intertwining, run up to an almost equal height of 265ft. Another great tree is called the 'Key Stone State,' 325ft. high; its branches begin at 150ft. from the ground. But perhaps the greatest curiosity is a big fellow, which has been purposely thrown, cut off 6ft. above the ground, and a pavilion built on the standing stump. There is room enough in the pavilion for a very pretty dance—space for two sets of Lancers, or for sixteen couples to spin round with ease. We measured the dancing space, and found the diameter 30ft., less 20in.; the circumference, 85ft."

Sequoias are readily propagated by means of cuttings, inserted in sandy loam, under a hand glass, in autumn, and kept shaded from bright sunlight, in a somewhat moist atmosphere, until roots are formed. The variegated forms

Sequoia—*continued.*

are better grafted. All are almost indifferent as to soil. When seeds are to be had, they should be sown in a cold frame, in spring, and the seedlings transplanted, as soon as they are large enough to handle, to the open ground.

FIG. 476. YOUNG BRANCH OF SEQUOIA GIGANTEA.

S. gigantea (gigantic).* Big-tree; Mammoth-tree. *l.* needle-shaped, spirally alternate, spreading, light green on young plants; those on adult trees scale-formed, closely inlaid, rounded at back, concave above; those on the branchlets much shorter, very close, and regularly imbricated; those on the larger branches longer, looser, decurrent at base, and tapering to an acute point. *cones* solitary on the ends of the branchlets, 2in. long, ovate, blunt. Branches horizontal, much divided; branches cylindrical, frequently pendulous, thickly leafy. 1853. See Figs. 476 and 477. SYN. *Wellingtonia gigantea* (B. M. 4777-8; F. d. S. 892-3).

FIG. 477. BRANCHLET OF SEQUOIA GIGANTEA, WITH CONE.

Sequoia—*continued.*

S. g. aurea (golden). This differs from the type only in the golden or yellowish colour of some of the smaller twigs. It is a pretty form when in good condition.

S. g. pendula (pendulous).* Branches numerous, deflexed from their base, drooping regularly one over the other, so as to produce an elegant, compact, conical plant. 1871.

S. sempervirens (evergreen).* Californian Evergreen Redwood. *fl.*, males globular, solitary at the tips of the branchlets, on slender footstalks, thickly covered with small, scale-like leaves. *l.* on the lateral branches and branchlets linear, blunt, two-rowed, flat, alternate, straight, rarely falcate, shining, ½in. to 1in. long; those on the main branches and terminal points of the flower-bearing branchlets very short, narrow, sharp-pointed, or scale-like, imbricated or closely spiral. *cones* solitary, terminal, globular or egg-shaped, 1in. long; scales cuneiform. Branches horizontally spreading, irregularly scattered alternately along the stem; branchlets very numerous, in two rows, frequently drooping. The leaves turn purplish-brown in winter.

S. s. albo-spica (white-spiked). A form in which the tips of the young shoots are of a creamy-white colour.

S. s. glauca (glaucous). *l.* linear, acute, ¼in. long, of a fine glaucous-blue tint, particularly below, either loosely imbricated or openly disposed round the branches. Branchlets very much narrower and slenderer than in the type.

FIG. 478. FRUITING BRANCHLET OF SEQUOIA SEMPERVIRENS TAXIFOLIA.

S. s. taxifolia (Yew-leaved). This variety only differs from the type in having somewhat broader leaves. See Fig. 478.

SERANGIUM. A synonym of **Monstera** (which *see*).

SERAPHYTA (from *ser*, a silkworm, and *phyton*, a plant; in allusion to some fancied resemblance between the flower and the silkworm). ORD. *Orchideæ.* A monotypic genus. The species is a stove, epiphytal orchid, formerly included under **Epidendrum** (which *see* for culture).

S. diffusa (diffuse). *fl.* greenish-white, rather small, loosely racemose, pedicellate, forming a terminal panicle; sepals and petals equal, spreading; lip undivided, broadly cordate, the claw as long as the column. April. *l.* coriaceous, oblong or rather broad; sheaths closely appressed. Stem leafy, sheathing, and scarcely fleshy at base. *h.* 1ft. to 2ft. West Indies, 1816. SYN. *Epidendrum diffusum* (B. M. 3565; L. B. C. 846).

SERAPIAS (the old Greek name given by Dioscorides to one of the Orchids, and derived from the Egyptian deity Serapis). SYN. *Helleborine.* ORD. *Orchideæ.* A small genus (four or five species) of hardy, terrestrial orchids, natives of the Mediterranean region,

Serapias—*continued.*

one extending as far as the Azores. Flowers often rather large, few in a spike; sepals erect, connivent or coherent in a tube; petals sometimes smaller, sometimes scarcely shorter, but much narrower; lip three-lobed, the lateral lobes erect, the middle one tongue-shaped and pendulous. Leaves narrow. Tubers undivided. In habit the species much resemble those of **Orchis** (which *see* for culture).

S. cordigera (heart-bearing).* Heart-flowered Orchis. *fl.* brown and lavender; lateral segments of the lip obtuse, erect, connivent; middle one longer, ovate, often cordate at base, acuminate, the disk pilose, the basilar callus deeply bilobed; bracts often longer than the flowers; spike at first crowded. *h.* 1ft South Europe, 1806. (A. B. R. 475; B. M. 5868A; S. F. G. 932.)

S. Lingua (tongue-lipped). Tongue-flowered Orchis. *fl.* reddish-brown; lateral segments of the lip ovate, obtuse; middle one longer and narrower, oblong-lanceolate, acuminate; basilar callus obscure, sulcate or flat; bracts shorter than the flowers; spike at first loose. *h.* 1ft. South Europe, 1786. (B. M. 5868B; H. E. F. 111; L. B. C. 655; S. F. G. 931.) The variety *luteola* has yellowish and purplish flowers.

S. papilionacea-lingua (a natural hybrid between *Orchis papilionacea* and *S. Lingua*). *fl.* five or six to a spike; sepals and petals pale green and pale purple, veined; petals erect, free, broad, spreading, and recurved; lip bright purple, large, broadly cordate, the margins crenulate, the base with two tubercles on the very short claw. *l.* narrow-lanceolate, acuminate, pale green, unspotted. Stem 1ft. or more high. South of France, 1876. (B. M. 6255.)

SERENOA (named in honour of Sereno Watson, a distinguished North American botanist). ORD. *Palmæ.* A monotypic genus. The species is a handsome, greenhouse, dwarf, unarmed, tufted palm, closely allied to **Sabal** (which *see* for culture).

S. serrulata (serrulated).* Saw Palmetto. *fl.*, petals scarcely united; style slender; spadix densely tomentose, much shorter than the leaves. June. *fr.* black, eight to nine lines long. *l.* 2ft. to 4ft. high, circular in outline, fan-shaped, bright green; divisions fifteen to thirty, erect, slightly cleft at the apex, and without thread-like filaments in the sinuses; petioles plano-convex, slender, more or less spiny-edged, longer than the leaves. Stem 4ft. to 8ft. long, creeping, branching. Southern United States, 1840. SYN. *Sabal serrulata.*

SERIAL, SERIATE. Disposed in rows or series.

SERIANA. A synonym of **Serjania** (which *see*).

SERICEOUS. Silky; covered with closely-pressed, soft, straight pubescence.

SERICOCARPUS (from *serikos*, silken, and *karpos*, a fruit; alluding to the silky hairs on the achenes). White-topped Aster. ORD. *Compositæ.* A genus comprising five species of hardy, erect, perennial herbs, natives of North America. Flower-heads mediocre or small, corymbose or paniculate; involucral bracts rather broad, in many series; ray florets white; disk pale yellow, rarely changing to purplish; achenes silky-pilose; pappus bristles copious. Leaves alternate, sessile, entire or serrated. For culture of the under-mentioned species, *see* **Aster** (under which they are erroneously classed in some garden works).

S. conyzoides (Conyza-like). Silk Fruit. *fl.-heads* sometimes solitary and pedicellate, but usually sessile in small clusters; involucre somewhat turbinate; pappus ferruginous. June to August. *l.* ciliated, glabrous beneath, veiny, rather firm, 1in. to 3in. long. *h.* 1ft. to 2ft. 1778.

S. solidagineus (Solidago-like). *fl.-heads* small, glomerate at the extremities of the fastigiate peduncles; involucre cylindrical; pappus white. July to September. *l.* linear-oblanceolate or linear, obtuse, tapering to the base, entire, with serrulate-scabrous margins, obscurely dotted. *h.* 2ft. 1699.

SERICOGRAPHIS. Included under **Jacobinia** (which *see*).

SERINGIA (named in honour of Nicholas Charles Seringe, 1776-1858, Professor and Director of the Botanical Gardens at Lyons). SYN. *Gaya.* ORD. *Sterculiaceæ.* A monotypic genus. The species is an interesting, greenhouse, evergreen shrub, somewhat resembling a Commersonia in habit. A compost of sand, loam, and peat is most suitable to its culture. Propagation may

Seringia—*continued.*

be effected by young cuttings, inserted in similar soil, under a glass; or by seeds.

S. platyphylla (broad-leaved). *fl.* white, disposed in dense, terminal or leaf-opposed cymes, which are much shorter than the leaves; calyx about ½in. long; petals none; stamens five, alternating with the calyx lobes. June. *l.* ovate to ovate-lanceolate, acuminate, coarsely toothed, 3in. to 4in. or even 5in. long, often oblique at base, glabrous or sprinkled with minute, stellate hairs above, densely tomentose beneath. Branches loosely whitish- or rusty-tomentose. *h.* 10ft. Australia, 1822.

SERINGIA (of Sprengel). A synonym of **Ptelidium** (which *see*).

SERIPHIUM. Included under **Stœbe** (which *see*).

SERISSA (a name altered from the old Greek *Seris*, used by Dioscorides). SYNS. *Democritea, Dysoda.* ORD. *Rubiaceæ.* A monotypic genus. The species is a pretty, greenhouse, branched shrub, highly glabrous or with puberulous branchlets, the bark fœtid. It succeeds best in a mixture of loam, peat, and sand. Propagation may be effected by cuttings, inserted in sand, under a glass, in heat.

S. fœtida (stinking). *fl.* white, axillary or terminal, solitary or fascicled; calyx tube obconical, the limb four to six-parted, persistent; corolla funnel-shaped, pilose within the throat, the limb of four to six short, obtusely three-lobed, erecto-patent lobes. Summer. *l.* rather small, opposite, sub-sessile, often fascicled on shortened branchlets, sub-coriaceous, ovate, acuminate, nerved. *h.* 2ft. India, China, Japan, &c., 1787. (B. M. 361, under name of *Lycium japonicum.*) There is a variety with double flowers (a rare occurrence in this order), and another with gold-margined leaves (I. H. ser. i. 369).

SERJANIA (named in honour of Paul Serjeant, a French friar and botanist). SYN. *Seriana.* ORD. *Sapindaceæ.* A large genus (about sixty species) of stove, climbing or twining shrubs, all natives of tropical and sub-tropical South America. Flowers yellowish; sepals five (or four and two of them connate), imbricated, concave; petals four; racemes or panicles axillary, often bearing two tendrils. Leaves alternate, exstipulate (or with minute stipules), ternate, biternate, or impari-pinnate, often pellucid-dotted. A few of the species have been introduced, but they boast of no particular beauty, and are probably only cultivated in botanical gardens.

SEROTINUS. Comparatively late.

SERPENT WITHE. A common name for *Aristolochia odoratissima.*

SERPENT-WOOD. A common name for *Rauwolfia serpentina.*

SERPICULA (from *serpo*, to creep; alluding to the habit of the species). SYN. *Laurembergia.* ORD. *Halorageæ.* A genus comprising from two to four species of small, greenhouse, decumbent or creeping, branched herbs, inhabiting marshes in the warmer parts of Asia, Africa, and America. Flowers minute, usually fasciculate. Leaves opposite and alternate, sub-sessile, linear or lanceolate, entire or toothed. *S. repens*, a native of South Africa, the only species introduced, is now probably lost to cultivation.

SERPYLLOPSIS. Included under *Trichomanes.*

SERRATE, SERRATED. Beset with antrorse teeth.

SERRATULA (from *serrula*, a little saw; alluding to the serrated foliage). Saw-wort. ORD. *Compositæ.* A genus comprising about thirty species of hardy, perennial herbs, natives of Europe, North Africa, and Asia. Flower-heads purplish, violet, or rarely white, solitary or corymbose; involucral bracts many, imbricated, the outer ones shorter, the inner ones more or less scarious at the tips; receptacle densely bristly; florets regular, five-lobed; pappus hairs many-seriate, coloured. Leaves alternate, toothed or lyrate-pinnatifid. The genus is represented in Britain by *S. tinctoria*, the herbage of which

Serratula—*continued.*

yields a yellow dye. None of the species are very ornamental, the only one calling for description being *S. quinquefolia*. This thrives in any common soil, and may be increased by seeds, or by divisions. Several species erroneously included here by garden authorities are now placed under **Jurinea, Liatris,** &c.

S. quinquefolia (five-leaved). *fl.-heads* intense purple; involucral scales ovate, shortly mucronate, appressed, the inner ones elongated and scarious. July. *l.* slightly glabrous, impari-pinnatipartite; lobes sub-bigugate, confluent, ovate-lanceolate, toothed, the terminal one large. *h.* 3ft. Caucasus, 1804. (B. M. 1871.)

SERRULATE, SERRULATED. Serrate, with very small or fine teeth.

SERRURIA (named in honour of Dr. James Serrurier, Professor of Botany at Utrecht). Ord. *Proteaceæ.* A genus comprising about fifty-two species of desirable, greenhouse, densely leafy shrubs, confined to South Africa. Flowers solitary under the bracts, sessile, densely capitate, sub-regular; perianth narrow, often incurved, the limb ovoid or oblong, the segments cohering towards the base; hypogynous scales four, linear or filiform. Leaves scattered, very narrow, trifid, pinnatifid, or dissected, rarely undivided. A selection of the species known in gardens is given below. They require precisely similar treatment to **Protea** (which *see*).

S. abrotanifolia (Abrotanum-leaved). *fl.* pink, the segments shortly bearded; stigma black; heads sessile, nearly as large as a walnut. July. *l.* 1in. to 1½in. long, slender, biternate, bipinnatifid above the middle, pilose. Branches glabrous. *h.* 3ft. 1803. Syn. *Protea abrotanifolia hirta* (A. B. R. 522).

S. arenaria (sand-loving). *fl.* purple, five lines long; heads longer than the tomentose peduncles, globose, about the size of a cherry. July. *l.* clustered, often secund, about 2in. long, slender, pinnate or trifid, the adults glabrous. Branches slender, simple. *h.* 1ft. 1803. Shrub erect or decumbent.

S. Burmanni (Burmann's). *fl.* purple, three to four lines long, clothed with dense, whitish or yellowish pubescence; partial peduncles shorter than the globose, many-flowered heads; corymb much-branched, rather shorter than the leaves. July. *l.* 1½in. long, slender, bipinnate; young ones clothed with short, cano-sericeous, adpressed pubescence, rarely spreading. *h.* 2½ft. 1786. Shrub erect, much-branched.

S. elongata (lengthened). *fl.* purple, minutely pubescent; bracts reddish-fuscous, ½in. long; heads as large as a cherry, sixteen to twenty-flowered; peduncle 3in. to 10in. long, leafless, remotely bracteate; partial ones ½in. to 1½in. long, few-bracted. July. *l.* 3in. to 4in. long, digitate, slightly wrinkled, obsoletely sulcate, and, as well as the erect branches, glabrous. *h.* 1½ft. to 2ft. 1810.

S. emarginata (emarginate). *fl.* pink, small, the segments slightly pilose; bracts lanceolate, acute, pink at apex; heads terminal and springing from the upper axils, simple, as large as a cherry. July. *l.* clustered, about 1in. long, slender, acute, bipinnatifid above the middle (or biternate), pubescent. *h.* 2ft. 1800. Syn. *Protea abrotanifolia minor* (A. B. R. 536).

S. florida (flowery). *fl.* purple, five to six lines long, the lamina bearded with golden-fulvous silk; heads in imbricating bracts, seven to nine lines long, approximate-corymbose, globose or ovoid, longer than the bracteate peduncle. July. *l.* spreading, 2in. to 3in. long, all pinnate or bipinnate, slender; young ones slightly pilose; adults (as well as the ascending branches) glabrous. Stem corymbosely branched. *h.* 2ft. 1824.

S. glaberrima (highly glabrous). *fl.* purple, very glabrous, or the young ones having a silky tube; heads as large as a cherry, globose, or at length ovoid, axillary or terminal, few-flowered; peduncles about 1in. long, the axillary ones slightly nodding, the terminal ones erect. July. *l.* remote, acute, erecto-patent, trifid or rarely pinnately five-cleft or sub-pinnatifid; upper ones undivided. Stem 1ft. or more long, prostrate, very slender. 1825. Adult plant highly glabrous.

S. millefolia (Milfoil-like). *fl.* purple; bracts glabrous at the apex; stigma truncate; peduncles equalling, or longer than, the simple heads. July. *l.* bipinnatifid from the base, pilose. *h.* 4ft. 1803. Syn. *Protea triternata* (A. B. R. 337).

S. nitida (shining). *fl.* purple, with very narrow claws; bracts nearly equalling the flowers, the outer ones glabrous, the inner ones very silky-villous; heads twice as long as the peduncles. July. *l.* nearly 1½in. long, pinnatifid or nearly bipinnatifid, slender, and, as well as the branches, highly glabrous. *h.* 2ft. 1823.

S. Niveni (Niven's). *fl.* purple, densely bearded; bracts lanceolate; heads sub-sessile, as large as a cherry. July. *l.* spreading, nearly 1in. long, bipinnatifid, channelled within, very acutely

Serruria—*continued.*

mucronate, and, as well as the branches, highly glabrous. *h.* 9in. 1800. Plant decumbent, much-branched. Syn. *Protea decumbens* (A. B. R. 349).

S. odorata (odorous). *fl.* pink, odorous, the outer ones at length reflexed-spreading; heads simple, terminal. July. *l.* bipinnatifid-filiform, acute, pilose. Sterile branchlets corymbose, exceeding the heads. *h.* 2ft. 1803. Syn. *Protea abrotanifolia odorata* (A. B. R. 545).

S. pedunculata (long-pedunculate). *fl.* purple, densely pubescent, slender, incurved; heads as large as a walnut or prune, solitary or corymbose; peduncles 1½in. to 3in. long, fulvous-tomentose. July. *l.* clustered, 1½ft. to 2ft. long, shortly pubescent, bi- or tripinnate nearly to the base. Branchlets often umbellate. *h.* 7ft. 1789. Syn. *Protea glomerata* (A. B. R. 264).

S. phylicoides (Phylica-like). *fl.* purple, the claw highly glabrous, the lamina snowy-bearded; heads as large as a hazel nut; peduncles sub-corymbose, longer than the heads. July. *l.* spreading, 1½in. to 2in. long, once-sulcate above, bipinnatifid or pinnatifid, glabrous; segments ½in. to 1in. long, undivided or rarely bifid, rather obtuse. Branches twiggy, loose, leafy. *h.* 3ft. 1789. Syn. *Protea abrotanifolia* (A. B. R. 507).

S. pinnata (pinnate). *fl.* pink, sometimes sub-arcuate, clothed with shortly appressed, whitish pubescence; heads globose, as large as a walnut, with villous-tomentose scales; peduncles ½in. to 1in. long. July. *l.* erect, 1in. to 1½in. long, slender, once-sulcate above, pinnately three to five-cleft, semi-terete, spreading-pilose, at length glabrous. Branches elongated, loosely leafy. 1803. Shrub prostrate. (A. B. R. 512.)

S. Roxburghii (Roxburgh's). *fl.* white, four to five lines long, loosely and adpressedly villous; heads ranging in size between a hazel nut and a plum, fulvous-villous. July. *l.* spreading, five to seven lines long, flabelliform, bipinnate, semi-trifid; segments divaricate, two or three-cleft or pinnatifid, minutely mucronulate. *h.* 3ft. to 4ft. 1806.

S. rubricaulis (red-stemmed). *fl.* purple, adpressedly silky-villous; bracts scarious; partial heads few-flowered; common peduncle shorter than the head, glabrous. July. *l.* erect, 1in. to 1½in. long, bipinnate or sub-pinnate, nearly glabrous. Branches straight, reddish, glabrous or slightly spreading-pilose. *h.* 2ft. 1818.

S. triternata (triternate). *fl.* purple, four to five lines long, densely pubescent; heads globose, as large as a cherry, densely many-flowered, at length slightly recurved; partial peduncles 1in. to 2in. long. July. *l.* spreading, 3in. to 5in. long, triternate or bipinnate, and, as well as the branches, glabrous; segments half spreading, ½in. to 1½in. long. Branches twiggy. *h.* 7ft. 1802. Syn. *Protea argentiflora* (A. B. R. 447).

S. villosa (villous). *fl.* purple, four to five lines long; heads as large as a cherry or a walnut, sessile, or sometimes very shortly pedunculate. July. *l.* spreading, nearly 1in., rarely 1½in., long, sub-biternate, at length glabrous; segments slightly diverging, with a slender, incurved or rarely straight mucro. Branches umbellate, straight. *h.* 2ft. or more. 1829.

SERSALISIA (in part). A synonym of **Lucuma** (which *see*).

SERTIFERA (from *sertum*, a garland, and *fero*, I bear; in allusion to the form of inflorescence). Ord. *Orchideæ.* A monotypic genus. The species is a stove, terrestrial orchid, having rather small flowers borne on rather long pedicels in short racemes, sessile, plicate-veined leaves, and a creeping rhizome. It is a native of Ecuador, but is not yet grown in gardens.

SERVICE BERRY. A common name for the fruit of *Amelanchier canadensis.*

SERVICE-TREE. *See* **Pyrus domestica.** The name is also applied to several other species.

SESAME. *See* **Sesamum indicum.**

SESAMUM (from *Sesamon*, the old Greek name used by Hippocrates). Ord. *Pedalineæ.* A genus comprising nine or ten species of stove, erect or prostrate herbs, all natives of tropical or South Africa. Flowers pale or violet, solitary in the axils, shortly pedicellate; calyx rather small, five-parted; corolla tube decurved; limb sub-bilabiate, the lobes five, somewhat spreading; stamens four. Capsules oblong or ovoid, two-celled, each cell containing numerous oily seeds. Lowest leaves opposite; uppermost ones, or nearly all, alternate, petiolate, entire, cut-toothed, trifid, or pedatisect. *S. indicum*, the only species in cultivation, is extensively grown in tropical countries for the oil contained in its seeds, which is sometimes called Gingelly Oil. For culture, *see* **Martynia.**

Sesamum—*continued.*

S. indicum (Indian). Gingelly or Gingilie Oil-plant; Sesame or Oily Grain, &c. *fl.*, sepals ¼in. long; corolla whitish, or with red, purplish, or yellow marks; pedicels solitary, rarely in twos or threes. July. *fr.* 1in. by ¼in., erect, two, or ultimately four-valved. *l.* oblong or ovate, 3in. to 5in. long, variable; upper ones often narrowly oblong and nearly entire; middle ones ovate and toothed; lower ones lobed or pedatisect. *h.* 1ft. to 2ft. India, &c., 1731. See Fig. 479. (B. M. 1688; B. M. Pl. 198.) SYNS. *S. luteum*, *S. orientale* (B. H. ix. 27).

S. luteum (yellow). A synonym of *S. indicum.*

S. orientale (Eastern). A synonym of *S. indicum.*

Sesbania—*continued.*

S. macrocarpa (large-fruited). *fl.* yellow and red, dotted with purple; racemes shorter than the leaves, one to four-flowered. August and September. Pods 8in. to 12in. long, pendulous, many-seeded. *l.*, leaflets oblong-linear, obtuse, mucronate. *h.* 3ft. Florida, Mexico, 1820. Greenhouse annual.

S. picta (painted). *fl.* yellow, the standard variegated with black dotted lines; racemes many-flowered, nodding. July and August. *l.* with twelve to sixteen pairs of oblong-linear, obtuse leaflets. *h.* 4ft. to 6ft. New Spain, 1823. Stove biennial. (B. R. 873.)

S. platycarpa (flat-fruited). A synonym of *S. vesicaria.*

FIG. 479. UPPER PORTION OF PLANT OF SESAMUM INDICUM.

SESBAN. *See* **Sesbania ægyptiaca.**

SESBANIA (from *Sesban*, the Arabic name of *S. ægyptiaca*). Pea-tree. Including *Agati* (inadvertently kept distinct in vol. i.), *Daubentonia*, and *Glottidium.* ORD. *Leguminosæ.* A genus comprising about sixteen species of stove or greenhouse herbs or shrubs, sometimes arborescent, inhabiting the warmer regions. Flowers yellow, dull scarlet, purple, variegated, or white, on slender pedicels; calyx broad; standard orbicular or ovate, spreading or reflexed, the wings falcate-oblong, the keel incurved; bracts and bracteoles bristly; racemes axillary, lax. Pods linear or rarely oblong, compressed. Leaves abruptly pinnate; leaflets many-jugate, entire; stipules highly caducous; stipels minute or absent. The species best known to cultivation are described below. All thrive in a compost of loam and sandy peat. The annuals may be increased by seeds; the shrubby kinds by cuttings of the half-ripened, stubby shoots, inserted in sand, under a bell glass, in heat.

S. ægyptiaca (Egyptian). Sesban. *fl.* yellow; standard roundish and without dots. July and August. *l.*, leaflets ten pairs, oblong-linear, obtuse, and rather mucronate. *h.* 5ft. Egypt, &c., 1680. Stove shrub.

S. grandiflora (large-flowered). *fl.* rose-red, white, or rusty-yellow, large; standard oval-oblong, shorter than the wings; racemes few-flowered. July and August. Pods 1½ft. long. *l.* consisting of many pairs of glabrous leaflets. *h.* 14ft. to 26ft. East Indies, 1768. Stove tree.

S. longifolia (long-leaved). *fl.* yellow; racemes a little shorter than the leaves. June to August. *l.* having eleven or twelve pairs of lanceolate, acute leaflets. *h.* 6ft. New Spain, 1820. Stove shrub.

S. punicea (red). *fl.* vermilion, in racemes. July. *l.* like those of the false Acacia. *h.* 3ft. Texas, 1820. A common plant in various parts of Banda Oriental and Rio Grande, where it grows into a large, handsome shrub. Stove. SYN. *Daubentonia punicea.*

S. vesicaria (bladdery). *fl.* yellow, few, loose; standard reniform, very short and broad; racemes axillary, pedunculate. July and August. *l.*, primordial ones ovate, simple, the rest abruptly pinnate, many-jugate. *h.* 5ft. to 7ft. Florida and Carolina, 1816. Greenhouse annual. SYNS. *S. platycarpa*, *Glottidium floridanum.*

SESELI (an old Greek name, used by Hippocrates, &c., for an umbelliferous plant). Meadow Saxifrage. Including *Bubon*, *Libanotis*, and *Wallrothia.* A genus comprising about forty species of mostly hardy, perennial or rarely biennial, erect, branched herbs, nearly all inhabiting the North temperate regions. Flowers white, in compound umbels; petals rather broad; involucral bracts numerous, few, or absent. Leaves ternate-pinnate, dissected or decompound; segments sometimes filiform, sometimes broader and incised. *S. dichotomum* and *S. gummiferum* are the only species calling for description here. *S. Libanotis* is a native of Britain. The plants thrive in ordinary soil, and may be increased by seeds.

S. dichotomum (dichotomous). *fl.* white; involucre wanting. June and July. *l.* pinnate; leaflets multifid, the segments linear. Stem terete, erect, clothed with fine down; lower branches short. *h.* 1ft. to 2ft. Tauria, 1818. Perennial. (B. M. 2073.)

S. gummiferum (gum-bearing). *fl.* white, tinged with pink; involucre of few leaflets, rarely wanting; umbel twenty-rayed. July to September. *l.* tripinnate, glaucous; leaflets cuneate, trifid. Stem thick, stiff, branched at top, yielding a gum when cut. *h.* 3ft. to 4ft. Tauria, 1804. A showy biennial. (B. M. 2259.)

SESIA. A genus of Moths, generally called "Clearwings," in reference to the absence of scales from the greater part of the surface of the wings, which are, consequently, nearly transparent. This, together with the length and narrowness of the wings, and the form and colouring of the bodies, gives the Moths a striking re-

FIG. 480. SESIA APIFORMIS.

semblance to insects of the widely-different groups of Bees, Wasps, and two-winged Flies. *S. apiformis*, one of the largest British species, is very like a hornet in general appearance (see Fig. 480), and is known as the Hornet

FIG. 481. SESIA VESPIFORMIS.

Clearwing. Others, *e.g.*, *S. vespiformis* (see Fig. 481) and *S. formicæformis*, are much like some of the smaller *Hymenoptera*; while others, *e.g.*, the Currant Clearwing (*S. tipuliformis*) closely resemble slender, two-winged Flies. These resemblances probably afford protection from enemies. The larvæ live in the branches, stems, or roots of various plants, boring into the wood or pith. They become pupæ in their tunnels. The more hurtful species are the following: Red-belted Clearwing (*S. myopæformis*)—the larvæ feed, often in large numbers, in the wood of Pear-trees; the moth is black, with a bright red belt round the middle of the abdomen.

FIG. 482. LARVA OF SESIA TIPULIFORMIS.

Currant Clearwing (*S. tipuliformis*) — the larvæ (see Fig. 482) are common in twigs of Currants; the moth is black, with two narrow, yellow lines on the back of

Sesia—*continued.*

the thorax, and three narrow, yellow belts round the body, and the wings are yellowish near the tip, with black veins. Red-tipped Clearwing (*S. formicæformis*)—the larvæ feed in Willow and Osier twigs; the moth is black, with a deep red belt round the abdomen, and a broad, red tip to each fore wing. Hornet Clearwing (*S. apiformis*)—the larvæ live in wood of Poplars, each feeding for two years; the moth is much like a hornet in size and colour, being marked with brown, orange, and yellow. Willow Hornet Clearwing (*S. bembeciformis*) —the larvæ live in twigs of Willows and Osiers; the moth is much like the last-named, but the head is brown, not yellow, and there are no yellow spots on the thorax.

Remedies are very difficult of application, because of the concealed mode of life of the larvæ. Of course, the moths ought to be captured, when they can be found, and this is most likely to be accomplished in the early morning, soon after they crawl out of the pupa cases, and while they are resting on the tree or twig. No remedial measures can be taken while the larvæ are in the wood; and when holes are visible the moths have escaped. Badly-infested trees should be cut down and burned, to destroy the larvæ. If twigs of Currants, Osiers, or other plants liable to attack, suddenly begin to droop, they should be cut off, and the larvæ therein destroyed.

SESLERIA (named in honour of Leonard Sesler, an Italian physician and botanist). ORD. *Gramineæ.* A genus comprising eight species of hardy, perennial, tufted grasses, natives of Europe and Western Asia. Spikelets two to six-flowered; panicle spike-formed, often short and bluish, or slightly silvery, sometimes elongated. Leaves flat or convolute-terete. The genus, which has no horticultural interest, is represented in the British Flora by *S. cærulea*, a plant growing from 6in. to 18in. high.

SESQUI. A prefix which, used in Latin compounds, signifies one and a-half; *e.g.*, Sesquipedalis, $1\frac{1}{2}$ft.

SESSILE. Sitting close on the supporting body, without any stalk.

SESUVIUM (signification of name unknown, probably arbitrary). ORD. *Ficoideæ.* A small genus (about four species) of stove or greenhouse, erect or prostrate, branched, succulent herbs or sub-shrubs, scattered over tropical sea-shores. Flowers often flesh-coloured or purple, axillary, sessile or pedunculate, solitary, clustered, or rarely sub-cymose; calyx tube turbinate, the five lobes coloured within; petals absent; stamens five. Leaves opposite, slightly fleshy, linear or oblong; stipules none, or sometimes connate with the petiole in a stipulæform membrane. *S. Portulacastrum* and *S. repens* are both edible as potherbs, but have a rather salt taste. Two species, both greenhouse, decumbent perennials, call for description here. These thrive in any well-drained, sandy soil. Propagated freely by slightly dried cuttings, inserted in similar soil, under a glass. Water must be sparingly administered.

S. Portulacastrum (Portulacastrum). Sea Purslane; Samphire or Seaside Purslane of the West Indies. *fl.* pedicellate; calyx green outside, reddish within; stamens twenty-five to thirty. June and July. *l.* linear or lanceolate-oblong, flat. 1632. (A. B. R. 201, under name of *Aizoon canariense.*) The variety *sessile* has sessile flowers.

S. revolutifolium (revolute-leaved). *fl.* red and white, sessile; stamens very numerous; stigmas five or six. July and August. *l.* ovate-oblong, with revolute margins, rather glaucous, not deep green. Cuba. (B. M. 1701, under name of *S. Portulacastrum* var.)

SETA. A bristle or bristle-shaped body; a slender, straight prickle; a stiff hair.

SETARIA (from *seta*, a bristle; alluding to the involucre of bristles surrounding the spikelets). ORD. *Gramineæ.* A genus comprising about ten species of

Setaria—*continued.*

stove, greenhouse, or hardy annual, sometimes tall grasses, broadly dispersed over tropical and temperate regions. Spikelets ovate, articulated with the pedicels in a dense, cylindric, terminal panicle, as in *Panicum*, but awnless, and with stout, rough bristles at the base on one side. Leaves flat. The genus, which has no horticultural value, is represented in Britain by *S. viridis* (Bottle Grass; Green Fox-tail Grass). *S. verticillata* has become naturalised in cultivated fields.

SETHIA. Included under *Erythroxylon.*

SETIFORM. Bristle-like.

SETIGEROUS. Bristle-bearing.

SETOSE. Bristly; covered with stiff hairs.

SETTERWORT. A common name for *Helleborus fœtidus.*

SETULOSE. Slightly bristly.

SET WALL. An old name for Valerian (*Valeriana*).

SEVERINIA (named after M. A. Severino, 1580-1656, Lecturer on Anatomy at Naples). ORD. *Rutaceæ.* A monotypic genus, now included, by Bentham and Hooker, under *Atalantia.* The species is a very desirable, greenhouse, evergreen shrub, requiring culture similar to **Citrus** (which *see*).

S. buxifolia (Box-leaved). *fl.* white, small, sub-sessile, solitary or disposed in small axillary glomerules; stamens ten, free. May. *l.* simple (one-foliolate), coriaceous, persistent, entire. *h.* 3ft. China.

SEVILLE ORANGE. *See* **Citrus vulgaris.**

SEWERZOWIA (named in honour of the Russian traveller who first collected the plant). ORD. *Leguminosæ.* A monotypic genus, which probably should be included under *Astragalus.* The species is a hardy annual, requiring ordinary culture.

S. turkestanica (Turkestan). *fl.* small, in few-flowered racemes, partly concealed between a pair of stoutly-fringed bracts. Summer. *l.* impari-pinnate; leaflets six to ten pairs, small, oblanceolate, retuse. *h.* 6in. Turkestan, 1883. (R. G. 1883, p. 250.)

SEX. This term, used in Latin compounds, signifies six; *e.g.*, Sexangular, six-angled; Sexpartite, six-parted.

SEYMERIA (named in honour of Henry Seymer, an English naturalist). SYN. *Afzelia* (of Gmelin). ORD. *Scrophularineæ.* A genus of mostly hardy, erect, branched, annual or perennial herbs; nine species are known, of which one is a native of Madagascar, and the rest are North American. Flowers yellow, in interrupted racemes or spikes; calyx campanulate, with five entire or denticulated lobes; corolla tube short and broad, the limb of five broad or oblong, spreading lobes; stamens four, sub-equal; pedicels solitary, ebracteolate. Leaves mostly opposite, cut-toothed or dissected; upper floral ones reduced to entire bracts. Two species have been introduced. Both are hardy, North American annuals, and are very pretty subjects when in flower. Seeds should be sown in a well-drained bed of rather light, rich soil.

S. pectinata (comb-like). *fl.*, calyx lobes linear; corolla hairy outside, especially in the bud. July. *l.* pinnately parted into rather few short or oblong-linear divisions, or the upper ones incisely few-toothed or entire. *h.* 1ft. 1820.

S. tenuifolia (slender-leaved). *fl.* on filiform pedicels; calyx lobes bristly; corolla ½in. long. July. *l.* ½in. long, copiously once or twice pinnately parted. *h.* 2ft. to 4ft. 1730.

SEYMOURIA. Included under **Pelargonium** (which *see*).

SHAD-BUSH. A popular name for *Amelanchier canadensis.*

SHADDOCK. *See* **Citrus decumana.**

SHADING. Throughout the summer months, nearly all indoor plants are benefited by being protected from exposure to the direct rays of the sun, even if they do not absolutely require Shading. Particularly is this remark applicable to stove and greenhouse plants, very few of which, unless they can be placed in the open air, are successfully grown without more or less shade under glass. As a rule, the Shading used should be sufficiently thin to allow light to pass through it, while preventing the sun's rays doing injury. A great variety of material, in various thicknesses, is procurable for Shading plants; the system of fixing thin blinds to rollers, which may be drawn up in dull weather, is one of the best. A permanent shading invariably weakens plants, because in dull weather they cannot get sufficient light. When rollers and blinds cannot be fixed because of the expense, or for other reasons, perhaps the best alternative is to thinly stipple the glass outside with whiting mixed with milk, or some oily substance, which will not readily wash off. If white should be objected to, the solution, before being applied, may be tinted with a substance known as Brunswick green; but, as Shading of this sort would be more or less permanent for a season, it should be put on very lightly. Cutting-boxes, hand-glasses, and small propagating-frames may readily be shaded with sheets of paper, which can be taken off at night and during dull weather.

SHAGGY. Pubescent with long, soft hairs.

SHAKING OR QUAKING GRASS. *See* **Briza media.**

SHALLON BUSH. A common name for *Gaultheria Shallon.*

SHALLOT (*Allium ascalonicum*). A hardy perennial, native of Palestine. It has been cultivated, from a very remote period, for the use of its bulbs for seasoning culinary preparations, and for pickling; the leaves are also sometimes eaten when they are young and green. Shallots may be readily propagated each year by dividing the bulbs or cloves, and planting them separately. Rich soil is desirable, but it should not be purposely manured for this crop if a piece of land is available which has been enriched during the previous year for something else. Single cloves should be planted, not deeply, in autumn or at the end of February, about 4in. or 6in. apart. The plants need but little attention through the summer beyond keeping the ground free from weeds. When the leaves turn yellow, about July, the bulbs may be pulled up, dried in the sun for a few days, and then stored for use, in a similar way to Onions, in any rather dry shed from which frost is merely excluded. There are two or three varieties of Shallot in cultivation. The true one has elongated bulbs, narrowed to a long point; it keeps well, and seldom runs to seed. A form or variety known as the Russian, or Large Red, has very large bulbs of a reddish-brown colour. The Jersey Shallot has larger and much rounder bulbs than the true variety; it does not keep so long, and the plants flower and produce seeds more frequently.

SHAMROCK. In some districts of Ireland, this name is applied to one or more species of Clover; in England, the Wood Sorrel is generally supposed to be the Shamrock.

SHAMROCK, INDIAN. *See* **Trillium.**

SHAMROCK PEA. *See* **Parochetus communis.**

SHARD-BORNE BEETLE. A name popularly applied to more than one of the large Beetles, whose habit it is to fly heavily along, and which are, therefore, rendered noticeable by their habits. The name is taken from the term *shard*, formerly employed to denote any hard, thin body, and therefore used for the hard wing-cases of Beetles, which, spread out in flight, help to bear the insects up in the air; hence, "Shard-borne."

Shard-borne Beetle—*continued.*

The Beetle to which the name is most frequently given is one known also by other names, such as Dor Beetle. Its scientific name is *Geotrupes stercorarius*, and signifies "Dung-loving Earth-digger," a name very well chosen, in

FIG. 483. SHARD-BORNE BEETLE.

allusion to the habits of the insect The Beetle (see Fig. 483) is usually about 1in. long, and is oblong and heavy in form. It is nearly black, or dark violet, or metallic-blue or green. The wing-cases are grooved lengthwise. The Beetles are abundant throughout Britain, flying heavily and clumsily in summer evenings, and often striking against people in their flight. The females are in search of dung of cattle or of other large animals. If dung is found, the Beetles burrow through it to the ground; and there they dig "tunnels," about 1ft. long, straight downwards. Into each tunnel they push a ball of dung, and lay an egg in the ball. The young grub is thus provided with dung as food; and in the tunnel it grows and becomes a pupa, and then a beetle, which emerges, and provides in like manner for its own progeny. All "Dung-Beetles" are harmless, if not actually useful in gardens, on account of their habits.

SHAREWORT. A common name for *Aster Tripolium.*

SHEARS. Double-bladed cutting instruments, various kinds of which are required in gardens, some for trimming hedges, others for clipping grass edgings, and others, again, for pruning. Hedge or hand Shears are in general use for cutting Holly or Yew Hedges, &c. Grass-edging Shears are provided with long handles, which workmen may use while standing in nearly an upright position: the form with a wheel attached for running along by the edge of the grass is not to be recommended in preference to the ordinary kind. Pruning Shears are made in several small sizes, for using with one hand to cut branches that are only of moderate dimensions; a form with strong handles about 3ft. long, sometimes called Parrot-bill Shears, is one of the most useful pruning instruments for cutting branches that are too large for severing with a knife or any other kind of Shears.

SHEATH. A part which is rolled round a stem or other body.

SHED. A covered building, either inclosed or constructed with one or both of the sides open. Sheds are always very convenient storehouses in gardens; as a rule, the covered space available for keeping things dry is far too limited. Tool Shed and Potting Shed, terms in frequent use, are self-explanatory. Open Sheds usually have a wall at one side only, with the roof at the other side resting on upright pillars. These afford accommodation for keeping wheel-barrows and various tools dry, and space for storing pots and potting soils, preparing manure for Mushroom-beds, &c.

SHEEP BERRY. *See* **Viburnum Lentago.**

SHEEP'S BEARD. *See* **Urospermum.**

SHEEP'S-BIT SCABIOUS. A common name for *Jasione montana.*

SHEET GLASS. For glazing horticultural structures, this is the Glass best adapted. It may be obtained in sheets of great dimensions, for cutting up into large or small panes, as desired. Sheet Glass is made in various

Sheet Glass—*continued.*

thicknesses, and its value is based on the number of ounces in weight which a square foot contains. Thus 21oz. Glass is more expensive than 16oz., as it contains the additional weight in each square foot of its surface, and is, consequently, thicker throughout. *See also* **Glass.**

SHELL-BARK HICKORY. *See* **Carya alba.**

SHELL-FLOWER. A popular name for several species of *Alpinia* and *Chelone*, and *Moluccella lævis.*

SHELTER. The value of Shelter cannot be over-estimated in connection with the cultivation of somewhat tender trees and shrubs, fruit-trees, kitchen-garden crops, and flowers, and gardening generally. A site naturally sheltered is always preferable; but this is not always at command, and artificial methods of protection have to be resorted to. Especially is Shelter necessary from cold and unfavourable winds, and on the sea-coast from the prevailing winds and salt spray. Young trees and shrubs in nursery plantations may be effectually protected by planting hedges at right angles to each other, so as to form squares. These may be of Beech, Privet, Hornbeam, Thorn, Holly, or Yew, any one of which may be grown to the desired height, and kept trimmed. For sheltering valuable alpines and perennials that are not quite hardy, hand-glasses or bell-glasses are well adapted; a little dry litter or bracken may be scattered over them as well during severe frost. Small hurdles, placed on the coldest and most exposed sides, are good for protecting some of the larger specimens, also for placing over half-hardy shrubs and trees on walls. A covering of Frigi-domo, or any woolly material, will afford a good deal of Shelter to plants in frames during winter, and this substance, or even ordinary netting, placed over wall-fruit trees, when in flower, will often secure a crop that would otherwise be lost. Branches of Common Spruce may be used with advantage for sheltering somewhat tender trees on walls, and for such plants as Tea Roses in beds, &c. For preserving specimen plants, such as shrubs, that are not hardy, some stakes may be tied together, so as to form a sort of hood, somewhat in the shape of an extinguisher, and covered close down to the bottom with ordinary garden mats. This may be lifted on and taken off in winter, according to the state of the weather, and will be found to provide ample Shelter to the plant beneath. The necessity of providing Shelter is referred to under **Garden** and **Seaside Grounds and Plants,** and in other places where the plants described are in need of a specially-favoured situation.

SHELVES. Boards of various widths, but generally about 1in. thick, used for standing plants upon in glass structures. They should be painted the same colour as the rafters and other parts of the woodwork. Shelves may either be movable or fixed to the framework of a stage, as in a greenhouse. A single Shelf along the back wall of a lean-to house, or suspended by irons from the roof, is often a valued place for growing small or medium-sized plants that need plenty of light.

SHEPHERDIA (named after J. Shepherd, curator of the Liverpool Botanic Garden, who died in 1836). SYN. *Leptargyreia.* ORD. *Elæagnaceæ.* A small genus (three species) of ornamental, hardy, deciduous shrubs or small trees, natives of North America. Flowers diœcious, small, very shortly spicate or racemose, opposite the small bracts at the sides of the rachis. Fruit-bearing perianth baccate and persistent at base. Leaves opposite, petiolate, oblong, entire. Two of the species have been introduced. They require similar culture to **Hippophae** (which *see*). *S. rotundifolia*, not yet introduced to cultivation, is a handsome shrub, peculiar to the mountains of Southern Utah.

S. argentea (silvery). Beef Suet-tree; Rabbit Berry. *fl.* yellow. April. *fr.* scarlet, edible, acid-flavoured. *l.* narrower than in

Shepherdia—*continued.*

S. canadensis, tapering at base, silvery on both sides. Tall shrub or small tree. 1820.

S. canadensis (Canadian). *fl.* yellowish, covered with rusty scales. May. *fr.* yellowish-red, insipid. *l.* elliptic or ovate, nearly naked and green above, beneath silvery-downy and scurfy with rusty scales. *h.* 3ft. to 6ft. 1759.

SHEPHERD'S CLUB. *See* **Verbascum Thapsus.**

SHEPHERD'S KNOT. A common name for *Potentilla Tormentilla.*

SHIELD-BUDDING. *See* **Budding.**

SHIELD FLOWER. The popular name for *Aspidistra.*

SHIELD-SHAPED. Round or oval and flat, with a stalk attached to the lower surface. *See* **Clypeate, Peltate,** and **Scutate.**

SHINGLE OAK. *See* **Quercus imbricaria.**

SHOEBLACK-PLANT, or **SHOE FLOWER.** A common name for *Hibiscus rosa-sinensis.*

SHOLA OR SOLAH PLANT. A common name for *Æschynomene aspera.*

SHOOTING STAR. A common name for *Dodecatheon Meadia.*

SHOT, INDIAN. *See* **Canna.**

SHOVELS. There are several sorts of these, all of which are found useful in gardens. Shovels are lighter than spades, and better adapted for shifting light soil, short loose manure, sand, gravel, &c. Square-topped Shovels, having their two side edges slightly turned up, are most generally useful; those with a somewhat shield-shaped point are well adapted for shovelling gravel and stones. Stoke-hole Shovels should be made chiefly or entirely of iron, in order that they may withstand the heat to which they become subjected in stoking. The pan is best made long, and not very wide, as, when charged with coke, it may then be readily emptied into the furnace without coming into contact with the front, which is often very limited in width.

SHRIVELLING. A condition met with in immature fruit on plants growing in unfavourable conditions. The fruits, after being properly set, so far as can be judged from their appearance, begin to wither, and finally shrivel and fall off without ripening, so that the yield of fruit is frequently much lessened. The cause of this condition seems to be deficiency in the supply of water to the fruit, which usually shows no evidence of any disease due to parasitic Fungi or insects. Shrivelling is quite distinct from the fall of the fruit known as "Windfalls." This latter results from the presence in the fruit of insects, which eat the seeds and cause premature and imperfect ripening, with early separation from the plant. Such "Windfalls," on being cut open, will show clear traces of the cause of injury in the interior, round the seeds. The deficiency of water to which Shrivelling is ascribed may result from various causes: one of the most frequent is dryness of the soil or of the atmosphere, which causes evaporation from the green parts at a more rapid rate than that at which the roots can supply the fluid. Another cause of such deficiency is the luxuriant growth of leafy shoots on plants in sheltered, warm situations: evaporation goes on from them in excess of the power of the roots to supply the full amount needed by leaves and fruits. Poor soil and insufficient nourishment have been suggested as causes.

Remedies must be selected according to the cause, which must first be carefully sought out. If the soil is poor, manure should be supplied; if it is too dry, it must be watered. Any excess in green shoots must be pruned away. Ringing the fruiting branches—*i.e.*, the removal of a narrow ring of bark from their bases—has

Shrivelling—*continued.*

been found very useful in diminishing the loss by Shrivelling; it tends, besides, to improve the quality of the fruit, and hastens the period of ripening. It acts by preventing the passage downwards, through the bark, of the food formed in the leaves of the branch, so that all the food is retained for the nourishment of the products of the branch itself. This method is applicable only to Dicotyledons with a distinct bark; but these include all the fruit-bearing plants of the colder temperate regions. Some plants bear the operation well; but, in general, it should only be performed as a last resort, as the branches are apt to die above the ring, or to snap off at it, and the parts below the ring do not get enough nourishment, owing to the obstacle interposed by it to the descent of the elaborated sap. The roots, too, suffer if many branches are ringed, and the whole plant is thus weakened and may die from the effects. There is also danger of parasitic Fungi or insects obtaining entrance into the tissues before the wound produced by ringing the branch has been properly healed.

SHRUB. A low, woody-stemmed perennial.

SHRUBBERIES AND SHRUBS. The term Shrubbery is usually applied to a plantation of Shrubs, although many other plants not strictly of a shrubby nature may be intermixed. Shrubs are divided into two great classes, deciduous and evergreen; both are very largely represented in gardens, but, unfortunately, with some few exceptions, they do not generally receive the attention which they deserve. In the embellishment of flower-gardens and pleasure-grounds, Shrubs play a most important part; indeed, take these away, and more than half the beauty is gone. Some are best planted in large clumps by themselves — Rhododendrons, for instance — although such clumps may be associated with others where any kind of grouping is attempted, or an American garden laid out.

A point of great importance which, it is to be feared, is too often overlooked, is that Shrubs which have annually to perfect their wood for flowering—be they deciduous or evergreen—should not be planted under the shade of trees: they need an open situation, and plenty of light, if proper development is to be attained. There are some evergreen subjects that do well under trees, but they are extremely few compared with those which fail to thrive under such conditions. Forest-trees should not be admitted permanently into a Shrubbery: if planted there when young, it should be with a view to subsequent removal. Trees may, however, be utilised to form a background if they are sufficiently far away to prevent their roots from robbing the soil. Mixed Shrubberies are generally arranged and planted with a view to producing an effect throughout the summer; but by making a suitable selection, and arranging with judgment, they may be rendered attractive, either in flower or foliage, throughout the whole year. As a boundary or screen dividing cultivated from wild grounds, or as a background for a mixed border in flower-gardens, evergreen Shrubs are unsurpassed. American Shrubs, when they can be obtained in quantity, are best planted in beds by themselves, or plants of very dwarf stature may appropriately form an edging for others which do not exceed some 3ft. or 4ft. in height.

An endless variety of subjects, both evergreen and deciduous, may be accommodated in a mixed Shrubbery of only moderate extent, but the planting should only be entrusted to persons having a knowledge of the different habits and dimensions which are likely to be attained. For instance, the front line should be restricted to plants that habitually remain compact, and do not grow tall, while the back part may be filled with such specimens as are of the opposite description. The centre space will then accommodate others of medium stature, and the eye will gradually pass from front to back,

Shrubberies and Shrubs—*continued.*

while the habits of the various Shrubs employed will invariably prevent an undue formality. Overcrowding is especially to be avoided, but in planting a new Shrubbery, a large number of duplicates may be inserted, with a view of treating them as being in a nursery for a year or two, and then transplanting elsewhere as the permanent specimens require additional space. Constant attention is necessary in mixed Shrubberies, to prevent each plant, particularly if it be a strong-growing one, from overgrowing its neighbour. This is a matter too often overlooked or neglected, and the consequence is that a slower-growing, but, as a rule, much more valuable, plant is either destroyed or disfigured because of the rampant growth of something else in too close proximity, as, for example, variegated Aucuba, Box, common or Portugal Laurels, or Yew. It is much better to keep all of these out of a Shrubbery, or relegate them to some back position where they may be allowed to grow and thicken without injuring the more select occupants.

Ground intended for a Shrubbery should be well trenched or deeply dug over before planting is attempted; it is then an easy matter to make holes whereever they are required, and the soil, on being dug out again, will break up finer for intermixing amongst the roots. October is the best month for the general transplanting of Shrubs, but many evergreens may be safely moved with balls at almost any season from August until the following May, except during frosty or snowy weather. The roots should not be kept out of the ground longer than is really necessary; they are nearly always active, and soon suffer if exposed and allowed to get dry.

Summer Pruning of Shrubs. It has been already remarked that if Shrubs in a mixed Shrubbery are to be kept within bounds, and each individual prevented from overgrowing its neighbour, constant attention in the matter of pruning is necessary throughout the summer, or at least during the growing season. Summer pruning of Shrubs is, unfortunately, too sadly neglected, when so many things are providing employment, but its advantages are none the less important, as, where it can be attended to, the results show. Shrubs usually flower on the wood made the previous year, but not always; sometimes, the blossoms appear from midsummer until autumn on the young shoots. Some knowledge of the habits and mode of flowering which the various kinds assume is therefore necessary, in order that pruning may be carried out at the proper time, and in the best manner. For instance, if a Shrub flowers naturally on wood of the previous year, and these growths are cut away in the autumn, or early the following spring, the embryo blossoms must be, as a matter of course, destroyed. Deutzias, Forsythias, Lilacs, the species of *Philadelphus*, Weigelas, and Viburnums, are examples of Shrubs such as those to which reference is made. The time to prune these, and many others of like habit, is in summer, immediately the flowers drop—that is, presuming it is attempted at all: some gardeners prefer letting such subjects grow at will, but this is scarcely allowable in the mixed Shrubbery. If the old shoots are removed as soon as the flowering is over, others will proceed from where these have been detached, and develop for the succeeding year, and the plant will not be materially enlarged in comparison with an unpruned specimen. Rhododendrons and hardy Azaleas, if they need pruning or cutting back, should receive it at a similar period—namely, as soon as the flowers fade. Many ornamental evergreen Shrubs, grown principally for their foliage, may frequently be improved by summer pruning, carried out more or less extensively, according to the position the plants occupy, and the purpose for which they are grown.

All Shrub pruning and cutting should be executed, whenever possible, with a knife, or one of the different instruments procurable for the purpose: the work may then be performed without cutting the foliage, or otherwise injuring the branches that are left. Clipping with shears is most objectionable, excepting when the Shrubs are planted as a hedge, a purpose for which Box, Holly, Privet, and Yew, are extensively employed.

SHRUBBY PINK. *See* **Dianthus fruticosus.**

SHUTEREIA. *See* **Palmia bicolor.** *Hewittia bicolor* is now the correct name of this plant.

SIBBALDIA. Included under **Potentilla** (which *see*).

SIBERIAN CRAB. *See* **Pyrus prunifolia.**

SIBERIAN PEA-TREE. *See* **Caragana.**

SIBTHORPIA (named after John Sibthorp, 1758-1796, Professor of Botany at Oxford, and the originator of "Flora Græca"). SYN. *Disandra.* Including *Hornemannia.* ORD. *Scrophularineæ.* A genus consisting of half-a-dozen species of greenhouse or hardy, prostrate, hairy herbs, often rooting at the nodes; they are natives of Western Europe, tropical and North-western Africa, Nepaul, and South America. Flowers yellow, yellowish-pink, or red, on axillary, solitary or fascicled pedicels; calyx campanulate, four to eight-cleft (often five-cleft); corolla tube short, sub-rotate; lobes of limb as many as, or one more than, the calyx lobes, spreading; stamens as many as, or one less than, the corolla lobes. Leaves alternate or fascicled, petiolate, orbicular-reniform and deeply crenate or incised-toothed. *S. europæa* (Cornish Moneywort, Pennyleaf, or Pennywort), comprised in the British Flora, is more curious than beautiful; but the variegated form is a pretty plant, well worth cultivating. The latter requires a light, well-drained soil, and should be grown in a cold frame or cool greenhouse, under a glass. Only one species—*S. peregrina*—calls for description here. It is a small, trailing, hairy, greenhouse perennial. When raised, its pendent branches and little, yellow flowers assume a very pretty appearance. It will succeed in any light, rich soil. Propagation may be effected by divisions or by cuttings, with or without a glass, in any shady situation.

S. peregrina (foreign). *fl.* yellow, four to five lines in diameter, five to eight-parted; stamens slightly shorter than the corolla; peduncles often fascicled, 2in. long. June. *l.* much crenated. Madeira, 1771. (B. M. 218, under name of *Disandra prostrata.*)

SICELIUM. A synonym of *Coccocypselum.*

SICKLEWORT. A common name for *Prunella vulgaris.*

SICYOCARPUS. A synonym of **Marsdenia** (which *see*).

SICYOS (an old Greek name, used by Theophrastus for the Cucumber; applied to this genus in allusion to the resemblance in, and affinity of, the species). ORD. *Cucurbitaceæ.* A genus comprising about a score species of half-hardy, climbing or prostrate, annual herbs, natives of the warmer parts of America, the Pacific Islands, and Australia. Flowers small or minute, monœcious. Fruit compressed or angular, rarely exceeding 1in. in length. Leaves angular or lobed, rarely profoundly three to five-lobed. Several of the species have been introduced, but they have no value as garden plants.

SIDA (an old Greek name, used by Theophrastus for the Water-Lily). Indian Mallow. ORD. *Malvaceæ.* A genus comprising about eighty species of stove, greenhouse, or hardy herbs, sub-shrubs or shrubs; about eight inhabit the warmer parts of Africa and Asia, thirteen are indigenous to Australia, and the rest are American. Flowers various-coloured and sometimes showy, sessile or pedunculate, solitary or glomerate, axillary or disposed in terminal heads, spikes, or racemes; calyx five-toothed or five-cleft; petals five, hypogynous; staminal column divided into numerous filaments at the apex; bracteoles absent, or distant from the calyx. Leaves alternate.

Sida—*continued.*

Only three species call for description here. They thrive in any rich soil. *S. Napæa* may be increased by seeds; and the others by cuttings, inserted in sand, under a glass, in heat. Many plants, formerly included here, are now classed under *Abutilon.*

S. inæqualis (oblique-leaved).* *fl.* on lateral peduncles about 2in. long; calyx segments ovate, acute, ferruginous, pubescent; corolla white, 2in. across when fully expanded, the petals clawed, densely glandular-pubescent outside. May. *l.* 4in. to 7in. long, slightly undulated, harshly pubescent, cordate-ovate, unequal at base, acuminate; petioles 1in. to 2in. long. *h.* 7ft. Brazil, 1829. Stove shrub. (B. M. 3436.)

S. Napæa (Napæa).* *fl.* white, large, disposed in umbellate corymbs; carpels ten, pointed. Summer. *l.* five-cleft; lobes oblong, pointed, toothed. *h.* 4ft. to 10ft. North America. A tall, smooth, hardy, herbaceous perennial. (B. M. 2913.)

S. sessiliflora (sessile-flowered). *fl.* yellow, small, somewhat glomerate, sessile, axillary and terminal; corolla scarcely twice the length of the calyx. August to November. *l.* cordate, acute, serrated. *h.* 3ft. South America, 1827. Stove sub-shrub. (B. M. 2857.)

SIDALCEA (from *Sida*, and *Alkea*, an ancient Greek name, used by Dioscorides for some *Malva*; alluding to the appearance and alliances of the plants). ORD. *Malvaceæ.* A genus comprising eight species of hardy, mostly perennial herbs, with the habit of *Malva* or *Althæa*, natives of Western North America. Flowers shortly pedicellate or sessile, disposed in terminal racemes or spikes; calyx five-cleft; petals rose-purple or white; staminal column duplex at apex. Leaves mostly lobed or parted. *S. candida* and *S. malvæflora*, perhaps the only species in cultivation, require culture similar to **Malva** (which *see*).

S. candida (white). *fl.* white, in terminal racemes, freely produced. Summer. *l.* roundish, seven-lobed, glossy, long-stalked. *h.* 2ft. to 3ft. Colorado, 1882.

S. malvæflora (Mallow-flowered). *fl.*, corolla lilac; racemes many-flowered; pedicels twice as long as the calyx. Summer. *l.*, radical ones orbicular, loosely five to nine-lobed or incised-crenate; primary ones sub-truncate at base; cauline ones profoundly seven to nine-cleft; segments trilobed, toothed at apex, the uppermost ones entire. Stem twiggy, slender. *h.* 1½ft. Texas, 1838. (B. R. 1036, under name of *Sida malvæflora.*) SYN. *Callirhoe spicata* (R. G. 737.)

SIDE-GRAFTING. A method of Grafting that may be adopted for supplying a branch or stem to a tree when one is deficient; it may be practised without cutting away the head of the stock. For mode of application, *see* **Grafting.**

SIDERITIS (an old Greek name, used by Dioscorides for several plants, and derived from *sideros*, iron; so named on account of a supposed property of healing flesh-wounds inflicted by iron). Ironwort. SYNS. *Burgsdorffia*, *Hesiodia*, *Marrubiastrum.* ORD. *Labiatæ.* A genus comprising about forty-five species of hardy or half-hardy, often woolly or softly pilose herbs, sub-shrubs, or shrubs, natives of the Mediterranean region and the Canary Islands, numerous in the Orient. Flowers often yellowish, small; calyx tubular, with five erect, usually somewhat spiny teeth; corolla tube included; limb bilabiate, the upper lip entire, emarginate, or bifid, the lower one trifid, its middle lobe much the largest; stamens four; whorls six to many-flowered, axillary or interruptedly or densely spicate. Nutlets ovoid, smooth. Leaves entire or toothed; floral ones reduced to bracts, or the lower cauline ones conformed. The species (a representative selection of which is given below) prefer a dry, sandy or chalky soil. Propagation may be effected by seeds, by cuttings, or by divisions. All have yellowish flowers, produced in summer.

S. canariensis (Canary Islands). *fl.*, corolla scarcely exceeding the calyx teeth, the upper lip emarginately bifid, the lower spreading; whorls twenty to thirty-flowered, sub-globose; racemes simple. *l.* ovate, crenate, cordate at base, 2in. to 4in. long, thick, wrinkled, velvety-woolly. *h.* several feet. Teneriffe, 1869. Greenhouse shrub. (Ref. B. 160.)

S. candicans (whitish). *fl.* sub-sessile; corolla scarcely exceeding the calyx; whorls usually ten-flowered, the lower ones distant; racemes simple. *l.* ovate, slightly crenate, truncately cordate at base, thick. *h.* 3ft. Teneriffe, 1714. Habit of *S. canariensis*, but wholly clothed with white wool. Greenhouse shrub.

Sideritis—*continued.*

S. incana (hoary). *fl.*, calyx white-woolly; whorls distant, about six-flowered. *l.* sessile, oblong-linear, obtuse, entire, ½in. to 1½in. long, white-woolly; upper ones small, remote. Branches white-woolly or tomentose. *h.* 1ft. Spain, 1752. Half-hardy sub-shrub.

S. perfoliata (perfoliate-leaved). *fl.* sessile; corolla scarcely exceeding the calyx teeth; whorls all distinct, rather distant. *l.* half-amplexicaul, ovate-oblong or lanceolate, softly villous, 1½in. to 2in. long; floral ones broad, spreading. Branches erect, 1ft. to 1½ft. high. South Europe, 1731. Half-hardy sub-shrub.

S. scordioides (Scordium-like). *fl.*, corolla yellowish, the upper lip paler or white, slightly exceeding the calyx teeth; whorls interruptedly or densely spicate; spikes 1in. to 3in. long. *l.* ovate, oblong, or oblong-linear, narrowed at base, incised-toothed; floral ones very broad, spiny-toothed. *h.* 1ft. South Europe, 1597. Hardy sub-shrub.

S. s. alpina (alpine). *fl.* in densely or somewhat interruptedly spicate whorls. *l.* oblong-ovate, few-toothed, cano-villous or at length glabrous. Branches short, decumbent. Pyrenees, 1827.

S. s. angustifolia (narrow-leaved). *l.* oblong-linear, almost glabrous. Pyrenees, 1597.

S. s. elongata (elongated). *fl.* in interruptedly or rarely densely spicate whorls. *l.* oblong or oblong-lanceolate, incised-toothed, nearly glabrous. Branches elongated, ascending or erect. Spain, 1822.

S. taurica (Taurian). *fl.*, corolla slightly larger than the calyx. *l.* thick, oblong-lanceolate or spathulate, narrowed at base, the lower ones crenulate, densely white-woolly. *h.* 1½ft. Tauria, 1822. Hardy sub-shrub.

SIDERODENDRON. A synonym of **Ixora** (which *see*).

SIDEROXYLOIDES. A synonym of **Ixora** (which *see*).

SIDEROXYLON (from *sideros*, iron, and *xylon*, wood; alluding to the very hard wood furnished by the various species). SYNS. *Achras* and *Sapota* (as far as the Old World species are concerned), *Robertsia.* ORD. *Sapotaceæ.* A genus comprising nearly sixty species of stove or greenhouse, glabrous or pubescent trees or shrubs; they are broadly dispersed through the tropics, a few are found in the extra-tropical regions—South Africa, Australia, and New Zealand—and one in Madeira. Flowers usually small, sessile or pedicellate, fascicled at the nodes or axillary, five-parted; calyx segments closely imbricated; corolla broad or tubular-campanulate. Berries ovoid or globose. Leaves coriaceous, scattered. The fruits of *S. dulcificum* have a very sweet taste, and are known, with others, in West Africa, under the name of Miraculous Berry. Several of the species have been introduced, but they are of little or no value from a garden standpoint.

SIDE-SADDLE FLOWER. *See* **Sarracenia.**

SIEBERA (so called in honour of F. W. Sieber, of Prague, 1785-1844, a botanist who travelled in the East). SYN. *Trachymene* (of De Candolle). ORD. *Umbelliferæ.* A genus comprising fourteen species of greenhouse, rigid herbs with a perennial (almost woody) stock and virgate branches, or Heath-like shrubs, glabrous or slightly glandular-pubescent, all natives of Australia. Flowers white, small; calyx teeth small, but usually conspicuous; petals entire; involucral bracts small; umbels compound or rarely simple, terminal. Leaves all entire, or the lower ones divided or all reduced to small scales, without stipules. The under-mentioned species is, perhaps, the only representative of the genus which has been introduced to English gardens, and is probably not now in cultivation. For culture, *see* **Trachymene.**

S. Billardieri lanceolata (Billardière's, lanceolate-leaved). *fl.*, involucral bracts linear; umbels compound, sessile or pedunculed. *l.* lanceolate, acute, narrowed at the base, mostly above ½in. long. 1829. A shrub, either low and diffuse or erect and attaining a height of 2ft. to 3ft. (B. M. 3334, under name of *Trachymene lanceolata.*)

SIEBERIA. A synonym of **Habenaria** (which *see*).

SIEGESBECKIA (named in honour of John George Siegesbeck, M.D., a German botanist). ORD. *Compositæ.* A genus consisting of only a couple of species of hardy,

Siegesbeckia—*continued.*

usually annual herbs; one (including several so-called species propounded by various authors) is broadly dispersed over tropical and sub-tropical regions; the other is a native of Peru. Flower-heads yellow or white, small, paniculate, sub-radiate; involucral bracts few, herbaceous; receptacle small; achenes glabrous. Leaves opposite, often broad, toothed. Only *S. orientalis* calls for description here. Seeds should be sown on a hot-bed, in spring, and the seedlings, when strong enough, planted in the open border, at the end of May.

S. orientalis (Eastern). *fl.-heads* yellow; outer involucral scales three or four times longer than the inner ones. August. *l.* ovate-triangular, cuneate at base, acuminate at apex, deeply toothed. *h.* 2ft. Tropics, widely dispersed, 1824. (B. R. 1061; S. B. F. G. 203, under name of *S. droseroides.*)

SIEVERSIA. Included under **Geum** (which *see*).

SIEVES. These are in frequent demand for sifting soils intended for potting, seed-sowing, &c., also for screening cinders and gravel. What may be termed a handy set, would be one of each with ¼in., ½in., ¾in., and 1in. wire meshes respectively. For covering very minute seeds a small-meshed Sieve should be used, but the ¼in. size is fine enough for the major portion of seeds, if it is properly and carefully handled. Sieves for cleaning dry, ripe seeds are specially made for that purpose in different sizes.

SIGILLARIA. A synonym of **Smilacina** (which *see*).

SIGMATOSTALYX (from *sigma*, *sigmatos*, S-shaped, and *stalix*, a stake). ORD. *Orchideæ.* A genus comprising about seven species of dwarf, stove orchids, natives of tropical America. Flowers mediocre or rather small, shortly pedicellate, scattered, racemose; claw of the lip long, two-keeled; peduncles axillary under the one-leaved pseudo-bulbs. Few of the species are yet in cultivation. For culture, *see* **Oncidium.**

S. malleifera (hammer-bearing). *fl.* yellow, brown-spotted, developed at distant periods; sepals and petals ligulate-triangular, acute; lip three parted, the divisions linear, emarginate; callus hammer-like; raceme slender. *l.* light green, cuneate-ligulate, 5in. long, ½in. broad. Pseudo-bulbs dark brown, oblong, 1½in. long, ¾in. broad. New Grenada, 1883.

S. radicans (rooting). *fl.* yellow, greenish, and violet-purple, in an elongated raceme; sepals and petals cuneate-oblong, acute; lamina of the lip transversely sagittate, one to three-lobulate; calli in one or two series. *l.* cuneate, linear-ligulate, acute, twin. Pseudo-bulbs oblong-ligulate. Rhizome radicant. Brazil.

SIGMOID. Somewhat resembling in form the letter S.

SILAUS (an old Latin name, used by Pliny to indicate some umbelliferous plant). ORD. *Umbelliferæ.* A genus comprising only a couple of species of hardy, perennial, glabrous herbs, found in Europe and Russian Asia. Flowers yellowish or greenish-yellow, in compound umbels; bracts two or none. Leaves pinnately decompound; segments slender. *S. pratensis* (Meadow or Pepper Saxifrage) is a British plant. The species are of no value from a garden standpoint.

SILENE (said to be derived from *sialon*, saliva; alluding to the viscid exudation on the stems and calyces of many of the species; the English name Catchfly alludes to the same peculiarity). Campion; Catchfly. ORD. *Caryophylleæ.* A very large genus (400 have been described as species, but, according to Bentham and Hooker, few more than 200 are entitled to specific rank) of greenhouse or hardy, erect, tufted, decumbent, or diffuse-climbing, annual, biennial, or perennial herbs; they are mostly natives of South Europe, North Africa, and extra-tropical Asia, about a dozen are South African, scarcely eighteen are found in North America, and eight are included in the British Flora. Flowers solitary or variously cymose, often in unilateral spikes, forming a terminal thyrse or panicle; calyx variously tubular, five-toothed or five-cleft, usually ten-nerved; petals five, with a narrow claw and an entire, bifid, or rarely laciniate lamina, often having two scales at base;

Silene—*continued.*

stamens ten; disk usually columnar. Leaves opposite, entire. Amongst Silenes there are a few beautiful subjects for planting on rockwork, and in the open border, and none are difficult to cultivate. They succeed in almost any light, loamy soil, and may be readily propagated by one or more of the following methods—seeds, cuttings, or divisions. *S. pendula*, and its compact variety, are plants grown extensively for spring flower gardening, a purpose for which they are admirably adapted. The seed should be sown early in the previous autumn. The species best-known to cultivation are described below. All are hardy, except where otherwise indicated.

S. acaulis (stemless).* Cushion Pink; Moss Campion. *fl.* pink, rarely white, ½in. in diameter; calyx tubular, with obtuse teeth; petals notched. June to August. *l.* ¼in. to ½in. long, linear-subulate, close-set, channelled above, keeled below, ciliated. *h.* 2in. Europe (Britain), &c. A densely-tufted perennial. (A. F. P. 79; L. B. C. 568; Sy. En. B. 205.) *alba* is a white-flowered form.

S. alpestris (alpine).* *fl.* white, shining, rather large, panicled; calyx campanulately-clavate; petals with a four-toothed border and two-parted appendages. May to July. *l.* almost all radical, lanceolate, rather blunt. Stem simple, few-leaved, *h.* 6in. Austrian Alps, 1774. Perennial. (S. B. F. G. 111.)

FIG. 484. UPPER PORTION OF PLANT AND DETACHED FLOWER OF SILENE COMPACTA.

S. anglica (English). *fl.* in leafy, racemose cymes; calyx ½in. long, membranous, with pubescent ribs, the teeth setaceous; petals and scales small, entire or slightly bifid. June to October. *l.* variable; lower ones spathulate. *h.* 1ft. to 2ft. Europe (Britain), &c. An erect or diffusely-branched annual. *S. gallica* is a form with white or pink flowers and bifid petals; *S. quinquevulnera*, another variety, has entire, white petals with a red spot. (Sy. En. B. 202.)

S. Armeria (Armeria). Sweetwilliam Catchfly. *fl.* pink, in corymbose panicles; calyx long, clavate; petals obcordate, crowned. July to September. *l.* ovate-lanceolate, rather cordate at base. Stem branched. *h.* 1ft. to 1½ft. France and Switzerland (naturalised in Britain). A smooth annual. (Sy. En. B. 204.)

S. Atocion (Atocion).* *fl.* pink, in fastigiate, trichotomous panicles; calyx long, clavate; petals obcordate, obtuse, with an acute tooth on each side at the base, crowned by two

Silene—*continued.*

protuberances. June and July. *l.* roundish-obovate; lower ones on long footstalks; uppermost ones sessile. *h.* 6in. to 12in. Stem branched, pubescent. Levant, 1781. Annual.

S. chloræfolia (Chlora-leaved). *fl.* white, turning reddish as they fade, large, in a terminal panicle; calyx long, striped; petals cloven half-way down, with a two-lobed crest. August and September. *l.* elliptical, pointed; upper ones rather cordate. Stems branched. *h.* 1ft. to 2ft. Armenia, 1796. A smooth perennial. (B. M. 807; B. R. 1989; S. B. F. G. ser. ii. 263.)

S. compacta (compact). *fl.* pink, crowded into dense corymbs; calyx very long, clavate; petals oboval, entire, crowned; bracts narrow, shorter than the pedicels. July. *l.* ovate-cordate, sessile; two large ones, like an involucre, near the corymb, appearing as if they were connate. Stem erect, branched. *h.* 1½ft. Russia, 1823. A glabrous, glaucous biennial. See Fig. 484. (L. B. C. 1638; S. B. F. G. 64.)

S. Elizabethæ (Elizabethan).* *fl.* 1½in. in diameter; calyx margined with purple; petals bright rose-colour, the claws white below, the blade cuneate-flabellate, emarginate; panicle terminal, dichotomous. July. *l.* lanceolate, acute, spreading; lower ones 2in. to 3in. long, becoming gradually smaller upwards. Stems tufted, erect or ascending, and, as well as the leaves, viscid-pubescent. *h.* 9in. or more. Italy, 1863. Perennial. (B. M. 5400; R. G. 1009, 2.)

S. fimbriata (fringed-petaled). *fl.* white, in large, spreading panicles; calyx greatly inflated, with broad teeth; petals fringed, incurved after flowering. May to August. *l.* large, ovate-lanceolate, undulated, on long footstalks. *h.* 2ft. to 4ft. Caucasus, 1803. A pubescent perennial. (B. M. 908.)

S. gallica (French). A variety of *S. anglica.*

S. Hookeri (Hooker's).* *fl.* 2in. to 2½in. in diameter, solitary in the axils, or sometimes obscurely cymose; calyx 1in. long; petals pale pink, 2in. long, the lobes very variable, narrow or broad, equal, or the outer ones smaller or reduced to teeth, the two parallel white ridges on the claw terminating in white teeth at the blade. May. *l.* 2in. to 3in. long; lower ones elliptic-spathulate, narrowed into long petioles; the rest elliptic-lanceolate, acute or acuminate; all pubescent. Stems many, decumbent. California, 1873. Perennial. (B. M. 6051; F. d. S. 2093.)

S. inflata (swollen). Bladder Campion or Catchfly; Cow Bell; White Ben. *fl.* white, ¾in. in diameter, drooping; petals deeply cloven; panicle many-flowered. June to August. *fr.*, capsule globose. *l.* 1in. to 3in. long, variable, ovate, obovate, or oblong. *h.* 2ft. to 3ft. Europe (Britain), &c. A branched, glaucous, glabrous, or downy perennial. This species may be used as a substitute for asparagus or green peas, the young shoots having the flavour of both. (Sy. En. B. 199.) *puberula* is a rarer form, with downy leaves.

S. lacera (torn-petaled). *fl.* white; calyx much inflated; petals jagged, with the appendages two-parted. May to August. *l.* ovate-lanceolate, undulated, on long footstalks. Caucasus, 1818. A procumbent, hispid biennial. (B. M. 2255.)

S. laciniata (jagged-petaled). *fl.* crimson, with a white, two-parted crest, very large, terminal, rather drooping; calyx cylindrically ventricose; petals somewhat four-cleft; peduncles one-flowered. June and July. *l.* large, lanceolate, acute. Stem erect, branched. *h.* 3ft. to 4ft. Mexico and California, 1823. A half-hardy, pubescent perennial. (B. R. 1444; P. M. B. 267.)

S. livida (livid). *fl.* livid-green on the under surface, white above, panicled, drooping to one side; petals two-cleft, crowned. June and July. *l.* oblong-lanceolate. Stem flexuous, infracted. *h.* 1ft. Carniola, 1816. A pubescent perennial.

S. maritima (maritime).* *fl.* white; petals shortly cleft, the segments broad, with two scales at the base. June to August. Europe (Britain). A diffuse perennial. Otherwise resembling *S. inflata.* (Sy. En. B. 200.) *flore-pleno* is a garden form, with double flowers.

S. noctiflora (night-flowering). *fl.* erect, few; calyx narrow, 1in. long; petals rosy within, yellow outside, two-cleft. July and August. *l.* 3in. to 4in. long, oblong-lanceolate, acute, the lower ones petioled. *h.* 1ft. to 2ft. Europe (Britain), &c. An erect, simple or dichotomous, softly pubescent annual, viscid above. The flowers open at night, and are very fragrant. (Sy. En. B. 209.)

S. nutans (nodding). Nottingham Catchfly. *fl.* white or pink, in panicled or sub-racemose cymes, drooping, fragrant at night; calyx purple-nerved, with acute teeth; petals two-parted, the segments diverging. May to July. *l.*, radical ones oblong-lanceolate, 2in. to 5in. long, tufted, petioled; cauline ones small, narrow, sessile. Stem viscid above. *h.* 2ft. to 3ft. Europe (Britain), &c. A pubescent perennial, with a woody rootstock. (Sy. En. B. 207.) SYN. *S. paradoxa.*

S. ornata (ornamented). *fl.* dark purple, panicled; calyx cylindrical, with alternate stripes and veins; petals two-parted, with broad, crowned lobes. May to September. *l.* lanceolate, rather blunt. Stems erect, branched. *h.* 2ft. Cape of Good Hope, 1775. A pubescent, greenhouse biennial. (B. M. 382.)

S. paradoxa (paradoxical). A synonym of *S. nutans.*

S. pendula (pendulous-flowered).* *fl.* flesh-coloured, axillary, pendulous; calyx inflated; petals bifid, crowned. May to August. *l.* ovate-lanceolate. Italy, &c., 1731. A pubescent, branched, trailing annual. (B. M. 114.)

S. p. compacta (compact).* A very dwarf, compact variety, forming dense cushions, 2in. to 3in. high and 9in. to 12in. in diameter, entirely covered with bright pink flowers. This is a charming plant, extensively used for spring bedding. (F. M. n. s. 84.)

S. pennsylvanica (Pennsylvanian).* American Wild Pink. *fl.* pink, clustered, short-stalked; calyx club-shaped; petals cuneiform, slightly notched and erose. April to June. *l.*, radical ones narrowly spathulate, nearly glabrous, tapering into hairy petioles; cauline ones two or three pairs, lanceolate. Stems 4in. to 8in. high. North America, 1806. A pubescent perennial. (B. R. 247; L. B. C. 41.)

S. picta (painted). *fl.* pink, loosely panicled; calyx clavate, striped with red; petals reticulated with red nerves and veins. June to August. *l.*, lower ones obovate-spathulate; upper ones linear, acute. Stems much-branched, scarcely pubescent. *h.* 1ft. to 2ft. Asia Minor and Syria, 1817. A beautiful, Rush-like annual. (S. B. F. G. 92.)

S. quinquevulnera (five-spotted). A variety of *S. anglica.*

S. regia. Royal Catchfly. *fl.* deep scarlet, numerous, short-stalked, in clusters, forming a strict panicle; petals spathulate-lanceolate, mostly undivided. July. *l.* rather thick, ovate-lanceolate, acute. Stem roughish, erect, 3ft. to 4ft. high. Southern United States, 1811. A pubescent perennial. (B. M. 1724; S. B. F. G. ser. ii. 313.)

S. Saxifraga (Saxifrage).* *fl.* terminal, solitary, rarely axillary; calyx clavate; petals yellowish on the upper surface, reddish-brown beneath; peduncles very long. June to August. *l.* linear, acute. *h.* 3in. to 6in. South Europe, &c., 1640. A smooth, rather viscid, tufted perennial. (L. B. C. 454.)

S. Schafta (Schafta).* *fl.* purple, erect; calyx more than 1in. long, clavate; petals cuneate, denticulate; peduncles bearing one or two flowers. June to October. *l.* obovate, acute. Stems many, very simple, ascending; root woody. *h.* not more than 6in. Persia, 1844. A beautiful little perennial; the branches gradually become covered with blossoms. (B. R. 1846, 20; J. H. S. i. 69.)

S. speciosa (showy). *fl.* scarlet, axillary or terminal, paniculate; calyx elongated-tubular, villous; petals five, oblong, spreading, four-parted, the middle segments much longer, the lateral ones reduced to teeth. June. *l.* opposite, sessile, lanceolate, somewhat obtuse. *h.* 1ft. 1843. A villous, greenhouse perennial; probably a hybrid. (F. d. S. ii. 8; P. M. B. x. 219.)

S. supina (supine). *fl.* white, on short, alternate pedicels; calyx long, cylindrically clavate, tomentose; petals with long claws, bifid, crowned. June to August. *l.* linear, acute. Stems woody, procumbent, branched. Caucasus, 1804. A tufted, clammy-pubescent perennial. (B. M. 1997.)

S. vespertina (evening). *fl.* rose-coloured, in secund racemes; calyx bladdery-clavate; petals two-parted, the lobes obtuse. June and July. *l.* spathulate, acute, on ciliated petioles. Stems branched, diffuse or decumbent. *h.* 1ft. Greece, &c., 1796. A beautiful, pubescent annual. (B. M. 677; S. B. F. G. 58; S. F. G. 409.)

S. virginica (Virginian).* Fire Pink. *fl.* deep crimson, few, and loosely cymose, peduncled; calyx oblong-cylindrical, soon obconical; petals oblong, two-cleft. June to August. *l.* thin, spathulate, or the upper ones oblong-lanceolate. Stems slender, 1ft. to 2ft. high. North America, 1783. A pubescent perennial. (B. M. 3342; R. G. 1116.)

SILENOPSIS. Included under *Lychnis.*

SILICA. A very abundant mineral in the soil, both in the pure state, and in combination with various elements forming Silicates. Pure Silica is made up of the two elements Silicon, or Silicium, and Oxygen, in the proportion of twenty-eight parts, by weight, of the former to thirty-two of the latter. It occurs in several conditions, of which the most frequent are quartz and flint, and the less common rock-crystal and calcedony. Amethyst and cornelian are forms of Silica, tinged red with iron oxides. Silica, in the form of quartz, is the chief ingredient of all sands and sandstones, as well as of granites and other minerals of the same general structure; and veins or masses of pure quartz of considerable size also exist. But almost more plentiful than Silica are the Silicates, chiefly of Potassium, Sodium, Calcium, and Magnesium. These are familiar to everyone as clay, mica, felspar, and other substances that make up the mass of most soils.

Silica is not soluble in pure water; but a little Carbonic Acid gas, dissolved in the water, permits of a little Silica being dissolved; and almost all water that gains

Silica—*continued.*

access to the roots of plants contains an appreciable amount of Silica, either pure or, more frequently, combined with alkalies. Silica exhibits the properties of a weak acid, in its power of combining with various metals. It combines with these, in more than one proportion, certain compounds, called normal or basic Silicates, containing a larger proportion of the alkali than do the others. These normal Silicates are the ones that dissolve in water.

Silicates (especially normal Potassic Silicate) pass into the root-hairs of the plants from the soil, dissolved in the water absorbed by the hairs, and are then carried up the stems, as described under **Sap.** They are easily broken up by the acids formed in plants during growth, *e.g.*, Oxalic and Citric Acid, &c.: the metals combine with these acids to form new compounds, and the Silica is set free in the cell-sap; but, not being so soluble as the Silicates, it is mostly added to the walls of the cells, and is peculiarly often found in the layer or cuticle on the outer surface of the stems or leaves. In some plants, this layer is so strong and continuous that all the vegetable substance may be destroyed by means of Nitric Acid, or by burning on platinum-foil over a spirit-lamp, without destroying the continuity and markings of the cuticle, which even extends over the hairs. Such a deposit of Silica in the epidermis is well shown in many grasses, and still better in the Horsetails or *Equiseta*; but it is met with also in many other plants, *e.g.*, in *Deutzia scabra*, where it forms a beautiful object when all the vegetable matter in the cuticle has been destroyed.

The use of Silica to plants is very doubtful. It is present in the ash of almost all plants. In many it is so abundant as to seem of much importance to them; yet the results of experiments on growing plants in artificial soils from which it is almost absent, tend to the conclusion that the growth of plants is not greatly interfered with even when the supply of Silica taken in by them is far below that usually present in them. For example, the straw of grasses is usually very rich in Silica (frequently to the amount of one-half of the ash) when grown in ordinary soils; yet grasses grown in artificial soils, from which it has been excluded as completely as possible, and whose ash, in consequence, contains less than 1 per cent. of Silica, prove as healthy and vigorous in every way as if they had been grown in ordinary soils. Probably, a large proportion of the Silica is absorbed in the form of alkaline Silicates, as mentioned above; and the Silica remains as a deposit in the cell walls after the alkalies have been made use of in the nutrition of the plants. It has been suggested that Silica may be of service in two ways, viz., in giving strength and rigidity to the stems, and in rendering the cuticle harder, so that when spores of parasitic Fungi fall upon it, and begin to germinate, the mycelium tubes find greater difficulty in piercing into the tissues of the plants. The Silica in the cuticle may thus be a defence against disease from this cause, but, necessarily, against only such Fungi as bore through the cuticle into the inner tissues, and not against those which push in their mycelium through stomata.

SILICATES. *See* **Silica.**

SILICLE. A siliqua as broad as it is long, or broader.

SILICULOSA. A Linnean artificial order of the class *Tetradynamia*, having siliculose pods.

SILIQUA. The long, pod-like fruit of *Cruciferæ*. It consists of a pair of valves applied to a frame on which the seeds grow.

SILIQUOSA. A Linnean artificial order of *Tetradynamia*, having siliquose fruit.

SILK-COTTON TREE. A common name for the genera *Bombax* and *Eriodendron*.

SILKEN SISSY. An old name for *Asclepias*.

SILK-TREE. A common name for *Albizzia Julibrissin*.

SILK VINE. A common name for *Periploca græca*.

SILKWOOD-TREE. A name applied to *Muntingia Calabura*.

SILKY. *See* **Sericeous.**

SILKY OAK. A popular name for *Grevillea robusta*.

SILPHA. A genus of Beetles, the larvæ of which usually feed in the rotting bodies of animals, and are especially numerous in dead moles, birds, and other so-called "vermin," hung up as scarecrows. The insects of this genus are, for the most part, considerably depressed or flattened from above downwards, oval in outline, about ½in. or ¾in. long, with a small head, and furrowed wing-cases. They are almost entirely black, or brown-black, with a dull yellowish, downy coating, which is easily rubbed off. The grubs are more slender in form than the adult insects, and all the rings, except the three next the head, have the edges sharp, and prolonged forward into a tooth, and the tail ends in two sharp points. They are usually entirely black, or black with a narrow, tawny border. They are active in their habits, running about by means of three pairs of short but well-formed legs, situated on the front part of the body. When full-fed, they form cocoons in the soil, in which they become pupæ, and in due time beetles As long ago as 1844, larvæ of a *Silpha* were found feeding on Beets, in France; and in the same year they proved seriously injurious to Mangel-Wurzel crops near Londonderry, in Ireland. They devoured the young leaves almost as soon as the latter appeared, till only the larger ribs remained, and the plants, in consequence, died off largely. Mangel-Wurzel and Beets alone suffered; and such crops as Oats, Wheat, Potatoes, and Turnips escaped unharmed in fields where the former plants were entirely destroyed. From larvæ feeding on Beets, in France, there were reared beetles belonging to the species *S. opaca*, known as the Beet Carrion Beetle; and the same insect was also identified as the culprit in Ireland. It is rather under ½in. long, flattened, and brownish-black, with the tip of the body dull red. There are three ridges down each wing-case. This beetle had long been known to frequent dead bodies of animals. It is probable that other species of *Silpha* also injure Beets and other garden produce.

Treatment. For the sake of prevention, only manure free from such substances (*e.g.*, offal) as might attract the beetles should be used for ground on which Beets and Mangel-Wurzel are to be grown. Should the plants be attacked, dressings of gas-lime and of sulphur or soot, scattered over the wet leaves in dewy mornings, would probably be of service in checking the evil, as would also be paraffin dressings. All methods of strengthening the plants and promoting the growth of new leaves are of great importance, and manures may enable the crops to pass through an attack without serious results. But should the attack prove fatal, it will be well to utilise the ground for some other crop, which may be sown or planted with safety in the infested soil immediately after the removal of the Beets or Mangolds.

SILPHIUM (*Silphion*, the ancient Greek name used by Hippocrates for a plant which produced some gum-resin, perhaps asafœtida, and which was transferred by Linnæus to this genus). Rosin-plant. ORD. *Compositæ*. A genus consisting of eleven species of tall, coarse, hardy, perennial herbs, with a copious resinous juice, confined to North America. Flower-heads yellow, large, corymbose-panicled; involucre broad and rather flat the scales imbricated in many rows; ray florets numerous, fertile; disk florets sterile; achenes glabrous, surrounded by a wing, which is notched at the top. Leaves alternate,

Silphium—*continued.*

opposite, or whorled, entire, toothed, or lobed. The best-known species are described below. Dr. Asa Gray says of *S. laciniatum*: "On the wide, open prairies the leaves *are said* to present their faces uniformly north and south, whence it is called the Compass-plant"; this peculiarity, according to other authorities, is more noticeable in young specimens. Any ordinary soil is suitable for the culture of these plants, which are best placed at the backs of flower-beds. They may be increased by division.

FIG. 485. INFLORESCENCE AND LEAF OF SILPHIUM LACINIATUM.

S. laciniatum (torn).* Compass Plant; Pilot Weed; Polar Plant. *fl.-heads* few, 1in. to 2in. broad, somewhat racemose; involucral scales rigidly pointed; achenes broadly winged. July. *l.* pinnatipartite, petioled but dilating and clasping at base, the lower and radical ones ovate, 1ft. to 2½ft. long; divisions lanceolate or linear, acute, cut-lobed or pinnatifid, rarely entire. *h.* 3ft. to 6ft. Plant rough-bristly. See Fig. 485. (B. M. 6534.)

S. perfoliatum (perfoliate-leaved). *fl.-heads* corymbose; achenes winged and variously notched. July. *l.* entire, ovate, 6in. to 15in. long, coarsely toothed, the upper ones united by their bases, and forming a cup-shaped disk, the lower ones abruptly narrowed into winged petioles, which are connate by their bases. Stem 4in. to 8in. high, square. (B. M. 3354.)

S. terebinthinaceum (terebinthine). Prairie Dock. *fl.-heads* small; involucral scales roundish, obtuse, smooth; achenes narrowly-winged. July to September. *l.* ovate and ovate-oblong, somewhat cordate, serrate-toothed, rough, especially beneath, 1ft. to 2ft. long, on slender petioles. Stem smooth, 4ft. to 10ft. high, panicled at the summit, and bearing many heads. (B. M. 3525.)

S. trifoliatum (three-leaved). *fl.-heads* loosely paniculate; achenes rather broadly winged. August. *l.*, cauline ones lanceolate, pointed, entire or scarcely serrate, rough, short-petioled, in whorls of three or four, the uppermost ones opposite. Stem smooth, rather slender, 4ft. to 6ft. high, branched above. (B. M. 3355.)

SILVER BELL TREE. *See* **Halesia.**

SILVER BERRY. The fruit of *Elæagnus argentea.*

SILVER BRACTS. A common name for *Cotyledon Pachyphytum.*

SILVER BUSH. A common name for *Anthyllis Barba-Jovis.*

SILVER CEDAR. *See* **Juniperus virginiana glauca.**

SILVER FIR. The popular name for *Abies pectinata.*

SILVER-GRAIN. The glittering plates, in exogenous wood, caused by the division of the medullary rays.

SILVER ROD. A common name for *Asphodelus ramosus.*

SILVER-TREE. *See* **Leucadendron argenteum.** The name is also applied to *Elæagnus.*

SILVER WEED. *See* **Argyreia.** The name is also used for *Potentilla Anserina.*

SILVER Y MOTH. *See* **Plusia.**

SILYBUM (an old Greek name, applied by Dioscorides to some Thistle-like plants). ORD. *Compositæ.* A monotypic genus. The species is a glabrous, erect, biennial herb, included, in some books, under *Carduus.* "The specific name, *Marianum*, was given to this plant to preserve the legend that the white stain on the leaves was caused by the falling of a drop of the Virgin Mary's milk" (Lindley). The plant was formerly cultivated for culinary purposes, the root being boiled as a potherb, the heads treated like those of Artichokes, and the leaves used as a spring salad. It occurs in waste places, near gardens, &c., but is not indigenous to Britain. Any ordinary soil is suitable for its culture. Propagated by seeds.

S. Marianum (St. Mary's).* Blessed, Holy, or Our Lady's Milk Thistle. *fl.-heads* rose-purple, globose, 1in. to 2in. in diameter; involucral bracts coriaceous, closely appressed, with one very stout, terminal spine; receptacle fleshy, hairy, not pitted. July to September. *l.* large, alternate, sinuately lobed or pinnatifid, white-spotted above; teeth or lobes spiny. *h.* 1ft. to 4ft. South Europe, &c. (Sy. En. B. 681.)

SIMABA (the native name in Guiana of one of the species). SYN. *Zwingera.* ORD. *Simarubeæ.* A genus comprising about fourteen species of stove, evergreen or deciduous trees or shrubs, natives of South America. Flowers small or rather large; calyx small, four or five-lobed; petals four or five, longer than the calyx, spreading, valvate; disk narrow, erect; stamens eight to ten, included; panicles loose-flowered, short or elongated. Carpels one to five, drupaceous, the endocarp usually hard. Leaves alternate, impari- or abruptly pinnate, rarely one to three-foliolate; leaflets entire, coriaceous. Three species have been introduced, but *S. Cedron* is probably the only one now known in cultivation in this country. This is a small tree, remarkable for the febrifugal properties of its seeds, which have also been, from time immemorial, reputed, in its native place, as a remedy for snake-bites. It thrives in well-drained, turfy loam. Propagated by cuttings of the ripened wood, inserted in sand, under a glass, in heat; or by imported seeds.

S. Cedron. Cedron-tree. *fl.* disposed in racemes 3ft. to 4ft. long. May. *fr.* about the size of a swan's egg, one-seeded, four of the cells being barren. *l.* large, pinnate; leaflets twenty or more, narrow-elliptic, livid-green above, paler beneath. Trunk simple, erect, slender. *h.* 20ft. New Granada, 1846.

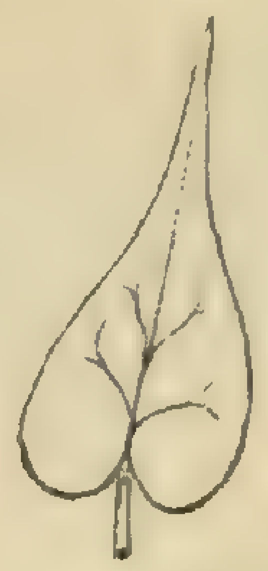

FIG. 486. SIMPLE LEAF.

SIMAROUBA (the Carib name of *S. amara*). Frequently spelt *Simaruba*. Bitter-wood. ORD. *Simarubeæ* A small genus (three species) of stove, evergreen trees natives of Eastern tropical America. Flowers sub-cymose, in axillary and terminal, elongated, branched panicles; calyx small, five-lobed; petals five, spreading at the tips, imbricated. Leaves alternate, abruptly pinnate; leaflets alternate, entire, coriaceous. Probably, the only species grown in this country is *S. amara*, which yields the drug known as Simaruba-bark. For culture, *see* **Quassia** (to which the genus is allied).

S. amara (bitter). Bitter or Mountain Damson; Stavewood. *fl.* yellowish-white; petals spreading; panicle exceeded by the leaves. May. *l.* oblong or lanceolate-oblong, mucronate, with a bluntish point, green on both sides; leaflets quite glabrous or pubescent beneath. *h.* (under cultivation) 10ft. West Indies, &c., 1789. (B. M. Pl. 56.) SYN. *S. officinalis*.

S. officinalis (officinal). A synonym of *S. amara*.

SIMARUBA. *See* **Simarouba.**

SIMARUBEÆ. A natural order of scentless shrubs or trees, often small, mostly inhabiting tropical and warm regions. Flowers diclinous or polygamous, rarely hermaphrodite, regular, usually small; calyx three to five-lobed or parted; petals three to five, very rarely wanting, imbricated or valvate; stamens inserted at the base of a hypogynous disk, as many, or twice as many, as the petals, rarely indefinite; inflorescence usually axillary, paniculate or racemose, rarely spicate or a solitary flower. Fruit a drupe, capsule, or samara. Leaves alternate or rarely opposite, pinnate, rarely one to three-foliolate or simple, not dotted, very rarely glandular; stipules wanting. Bark often bitter, sometimes very much so. The Simaruba of the druggist is yielded by the bark and trunk of *Simarouba amara* and *S. guianensis*. *Balanites ægyptiaca* bears drupes which, when old, are edible. The order comprises thirty-one genera, and about 112 species. Examples: *Balanites*, *Quassia*, *Simaba*, *Simarouba*.

SIMETHIS (so named after the nymph Simethis, the mistress of Acis). SYNS. *Morgagnia*, *Pogonella*. ORD. *Liliaceæ*. A monotypic genus. The species is a slender, hardy, perennial herb, with a root of fascicled fibres. It is found at Bournemouth, and at Derrynane, in Ireland, but is only an alien or a denizen. A compost of heath mould and sand is most suitable. The plant may be multiplied by division.

S. bicolor (two-coloured). *fl.* ¾in. in diameter, corymbose, jointed on the pedicel; perianth spreading, the segments white inside, purple on the back; scape panicled, as long as the leaves, bracteate. June. *l.* 6in. to 18in. long, ¼in. in diameter, recurved, surrounded at base with torn, fibrous, brown sheaths. Europe, North-west Africa. (Sy. En. B. 1541.) SYN. *S. planifolia*.

S. planifolia (flat-leaved). A synonym of *S. bicolor*.

SIMMONDSIA (named in memory of T. W. Simmonds, botanist and explorer, who accompanied Lord Seaforth to the West Indies, and who died in 1805). SYN. *Brocchia*. ORD. *Euphorbiaceæ*. A monotypic genus. The species is a small, hardy, evergreen, much-branched shrub. A compost of rich, light loam, and a little peat, is best suited to its requirements. Propagation may be effected by cuttings.

S. californica (Californian). *fl.* green, diœcious, apetalous, inconspicuous; males in sub-globose, sessile or very shortly pedun-

Simmondsia—*continued.*

culate clusters, solitary or sessile beneath a small bract; females solitary, on short and usually nodding pedicels. Mature nuts resembling an acorn in size and shape. *l.* opposite, sub-sessile, entire, coriaceous, penniveined. California.

SIMPLE. Consisting of not more than one distinct part; *e.g.*, a Simple leaf has one blade (see Fig. 486).

SIMPLER'S JOY. *See* **Verbena officinalis.**

SINAPIS (from the old Greek *Sinapi*, used by Theophrastus for Mustard). ORD. *Cruciferæ*. A small genus of European and Asiatic herbs, frequently cultivated, now included, by Bentham and Hooker, under *Brassica*. Calyx of four spreading sepals. Pods sessile, slightly terete or tetragonal; seeds globose. *S. alba* yields the white, and *S. nigra* the black, mustard. Both species are indigenous in this country, but are nevertheless largely cultivated. The seedlings or cotyledons of *S. nigra*, together with those of *Lepidium sativum*, form the salad well known as Mustard and Cress. Oil is obtained from several plants of this genus. The seeds of *S. arvensis* (the common Charlock or Corn Mustard) yield a good burning oil. Some authorities regard *S. nigra*, which, in Palestine, grows to a height of from 10ft. to 12ft., as the Mustard of Scripture, in preference to *Salvadora*. None of the species possess any horticultural value. *See also* **Cress** and **Mustard.**

SINCLAIRIA. Included under **Liabum** (which *see*).

SINISTRORSE. Turned or directed to the left.

SINNINGIA (named in honour of William Sinning, gardener to the University of Bonn, on the Rhine). SYN. *Gloxinia* (many cultivated species). Including *Biglandularia*, *Ligeria*, *Rosanovia*, *Stenogastra*, and *Tapeionites*. ORD. *Gesneraceæ*. A genus comprising about sixteen species of very pretty, usually dwarf, pubescent or villous, stove herbs, natives of Brazil. Flowers showy, rarely rather small, solitary or fascicled in the axils, on short or long pedicels; calyx tube short and broadly turbinate, the limb leafy, deeply five-cleft or five-parted; corolla tube sub-equal at base or gibbous at back, elongated, broadly cylindrical or campanulate, the limb of five broad, spreading lobes; stamens included. Leaves opposite, often ample, long-stalked; floral ones reduced to bracts. Stems rising from a tuberous rhizome, simple or scarcely branched, sometimes almost wanting. The species best known to cultivation are described below. They require similar treatment to **Gloxinia** (which *see*).

S. barbata (bearded). *fl.*, calyx nearly 1in. deep; corolla white, with red marks inside, much swollen at base, contracted at throat, hairy, 1½in. long; peduncles ½in. to 1½in. long, axillary, solitary or twin. Summer. *l.* oblong or oblong-lanceolate, a few inches to nearly 1ft. long, attenuated at both ends, acute, crenate-serrate, pilose above, crimson beneath; petioles ½in. to 1½in. long. Stem decumbent or ascending. 1867. (B. M. 5623; F. d. S. 1847; F. M. 336, under name of *Tapeionites Carolinæ*.) The variety *major* (I. H. n. s. 506) only differs from the type in its larger proportions.

S. concinna (neat).* *fl.*, calyx rather small, the segments much longer than the tube; corolla lurid-purple above, yellowish beneath, spotted within, nearly 1in. long, the tube much dilated towards the throat; peduncles axillary, scape-like, longer than the leaves. Summer and autumn. *l.* broadly round-ovate, deeply crenate, rather small. Stem ½in. to 1in. long, and, as well as the petioles, peduncles, and nerves, red. 1860. (B. M. 5253, under name of *Stenogaster concinna*; F. d. S. 1533 and I. H. 1864, 390, under name of *Stenogastra concinna*.) The variety *multiflora* (I. H. 1864, 390, left-hand figure, under name of *Stenogastra multiflora*) is a handsome garden plant, with larger leaves than its parent, and lilac-blue flowers.

S. conspicua (conspicuous).* *fl.*, calyx segments lanceolate, spreading; corolla yellow, paler without than on the inside, the lower part of the tube marked on the inside with elegant, purple lines and dots, obliquely infundibular-campanulate. Summer. *l.* opposite, ovate-oblong, shortly acuminate, slightly cordate at the base, dentate. Rhizome tuberous. *h.* 1ft. Brazil, 1868. Plant hairy, free-flowering. SYNS. *Biglandularia conspicua* and *Rosanowia conspicua* (R. G. 712). *Rosanowia ornata* (F. d. S. 2423-4) is a fine hybrid, with flowers of a pure white, lined with light rose on the tube and the two upper lobes of the corolla, the throat slightly greenish-yellow.

Sinningia—*continued.*

S. guttata (spotted). *fl.*, calyx narrow-campanulate; corolla pale greenish, the tube very thickly spotted with purple or fuscous dots, the upper lip of the limb slightly reclinate; peduncles shorter than the calyx, nearly equalling the petioles. June. *l.* oblong-ovate, acuminate, cuneate at base, crenate-toothed, entire at base, velvety-pubescent. Stem ascending, slender, leafy. *h.* 1½ft. 1827. This species much resembles *S. velutina.* (B. R. 1112; P. M. B. ii. 4.)

S. Helleri (Heller's). *fl.*, calyx red, large, sometimes 2in. long; corolla white, the throat greenish and spotted with red, often 3in. long, tumid at base, the lobes of the limb broad and round; peduncles erect, scarcely 1in. long. June. *l.* convex, ovate-oblong, 4in. to 7in. long, acute, mostly cuneate at base, crenate-serrate, velvety-pubescent, more or less approaching the soil; petioles (as well as the peduncles, stem, and under surface of leaves) purplish. Stem a few inches high, thick, and slightly woody. 1820. (B. R. 997; B. M. 4212, under name of *S. velutina.*)

S. hirsuta (hairy). *fl.*, calyx red, ½in. long, very villous, the segments sub-erect; corolla lilac, twelve to fourteen lines long and broad, the limb dotted with violet, the lobes sub-emarginate, the tube pale pilose outside, purple-spotted within; peduncles glomerate or sub-racemose, shorter than the leaves. July. *l.* few, broadly ovate, obtuse, cordate, 3in. to 5in. long, deeply crenate, purplish beneath; petioles 1in. to 1½in. long. Stem a few inches long, prostrate, clothed with long, white villi. 1824. (B. M. 2690, B. R. 1004, and L. B. C. 1296, under name of *Gloxinia hirsuta.*)

S. Menziesiana (Menzies'). *fl.*, calyx large, with very long, linear-lanceolate segments, densely hairy-villous; corolla ample, the limb violet, the throat copiously dotted with red; peduncles longer than either petioles or flowers. August. *l.* ovate, obtuse, cordate, crenate, villous. Stem shortened. (B. M. 3943, under name of *Gloxinia speciosa Menziesii.*)

FIG. 487. SINNINGIA SPECIOSA.

S. speciosa (showy).* *fl.*, calyx segments ovate-lanceolate, shortly villous; corolla usually violet in the type, ample, campanulate. September. *l.* oblong, obtuse or slightly acute, convex, usually attenuated at base, crenate, velvety and sparsely pilose. Stem short. 1815. From this species a large number of very beautiful garden varieties and hybrids have been raised, a list of which will be found under their popular name, **Gloxinia** (which *see*). See Fig. 487. SYNS. *Gloxinia Passinghamii* (P. M. B. xii. 267), *G. speciosa* (B. 105, 149; B. M. 1937; B. R. iii. 213, xxx. 48; L. B. C. 28), *Ligeria speciosa.* A selection of garden forms, widely differing in colour, are figured as Gloxinias in the following works: R. G. 1852, 4, and 1853, 44; P. M. B. xi. 199, and xv. 169; F. d. S. 1885 and 1918.

S. s. albiflora (white-flowered). *fl.* white. (B. M. 3206, under name of *Gloxinia speciosa albiflora.*)

S. s. caulescens (caulescent). *l.* larger than in the type. Stem produced, thick. 1826. (B. R. 1127 and L. B. C. 1566, under name of *Gloxinia caulescens.*)

S. s. macrophylla (large-leaved). *l.* very large, with white nerves. 1844. (B. M. 3934, under name of *Gloxinia speciosa macrophylla variegata.*)

S. s. rubra (red). *fl.* of a splendid red. (P. M. B. vii. 271, under name of *Gloxinia rubra.*)

S. velutina (velvety). *fl.*, calyx infundibular-campanulate, 1in. long, with triangular segments; corolla pale greenish, 1½in. to 2in. long, gibbous at base, constricted at throat, the limb spreading; peduncles shorter than the calyx. June. *l.* ovate, acute, rounded or nearly cordate at base, 2in. to 4½in. long, green on both sides, the nerves, as well as the stem and petioles, at length purplish, crenate-serrated, puberulous or often nearly glabrous above. Stem erect, sometimes 1½ft. high, slender, leafy. 1827. (L. B. C. 1398.)

S. villosa (villous). *fl.*, calyx amply or shortly campanulate, spreading, the segments ovate and slightly acute; corolla yellowish-green, almost semi-globose, 1½in. to 2in. long, the limb 1in. broad, sub-equal, spreading; peduncles shorter than the petioles. June. *l.* oblong-ovate, convex, acuminate, sometimes nearly lanceolate, 3in. to 5in. long, usually acute at base, crenate. Stem erect, 1½in. or more thick. *h.* 1ft. 1827. (B. R. 1134.)

S. Youngiana (Young's).* *fl.* axillary or terminal, solitary; calyx lobes ovate, acuminate; corolla more or less intensely violet or purple, with the exception of the campanulate tube, which is yellowish-white at the base, and at the throat, which is spotted; lobes almost equal, round. Summer. *l.* opposite, petiolate, oblong or ovate, crenated, pale or almost whitish below. Stem erect, purplish, 1ft. to 1½ft. high. Rhizome tuberous, several inches in diameter. A hybrid between *S. speciosa* and *S. velutina.* (B. M. 4954.)

FIG. 488. SINUATE LEAF.

SINUATE. Having a strongly waved or recessed margin. A Sinuate leaf is shown at Fig. 488.

SINUS. A term applied to the recesses formed when the edge of any part is lobed.

SIPHOCAMPYLOS (from *siphon*, a tube, and *kampylos*, curved; alluding to the form of the corolla). SYN. *Lobelia* (of Presl). ORD. *Campanulaceæ.* A large genus (nearly 100 species) of very beautiful, glabrous, hairy, or stellate-tomentose, stove or greenhouse herbs, sub-shrubs, or shrubs, sometimes climbing, natives of tropical America. Flowers red, orange, or purplish, rarely greenish, usually large; calyx tube adnate, the limb of five leafy lobes; corolla straight or incurved, the lobes often incurved, equal or unequal, sometimes bilabiate, the lateral ones sometimes connate with the upper ones; staminal tube adnate to the base of the corolla; peduncles one-flowered, ebracteate or minutely bibracteolate, axillary or forming clustered corymbs or loose racemes at the tips of the branches. Leaves alternate, rarely whorled, entire or denticulate, rarely incised-toothed or pinnately lobed or dissected. The introduced species are described below. They succeed in a light, turfy loam, and peat, and are propagated by cuttings. Except where otherwise indicated, they are herbaceous perennials.

S. amœnus (pleasing). A synonym of *S. villosulus.*

S. betulæfolius (Birch-leaved).* *fl.* red; calyx segments six times shorter than the corolla; pedicels axillary, solitary, exceeding the leaves. July. *l.* petiolate, ovate, acuminate, sub-cordate-triangular, 2in. long, somewhat doubly serrated, glabrous above, slenderly pubescent on the nerves beneath; petioles nearly 1in. long. Stem branched, terete, glabrous. *h.* 3ft. Organ Mountains, 1842. Stove. (B. M. 3973; P. M. B. ix. 223.)

S. bicolor (two-coloured). A garden synonym of *Lobelia laxiflora angustifolia.*

S. canus (hoary). A synonym of *S. macropodus.*

S. coccineus (scarlet).* *fl.* scarlet, nodding; corolla dilated upwards and curved, the limb scarcely bilabiate; peduncles longer than the leaves, axillary, solitary, one-flowered. July. *l.* ovate, acute, shortly petiolate, sometimes slightly lobed, doubly serrated. *h.* 3ft. Organ Mountains, 1844. A glabrous, stove sub-shrub. (B. M. 4178; F. d. S. ii. 9; P. M. B. xii. 173.) The variety *leucostomus* (F. d. S. 648) differs from the type in having the limb of the corolla almost white. A garden form, raised in the gardens of the King of Belgium, in 1850.

Siphocampylos—*continued.*

S. crenatifolius (crenate-leaved). *fl.* scarlet, tipped with yellow, axillary, solitary. Summer. *l.* oblong-elliptic, irregularly crenate, 5in. to 6in. long. *h.* 3ft. Brazil, previous to 1870. A showy, warm greenhouse shrub. (Ref. B. 227.)

S. fimbriatus (fringed). A synonym of *S. longepedunculatus.*

S. fulgens (brilliant). A synonym of *S. Humboldtianus.*

S. giganteus (gigantic). *fl.* reddish-yellow; corolla falcate, velvety, the tube equalling the calyx lobes, the lobes lanceolate-ovate; pedicels bibracteolate at base, often longer than the leaves. July. *l.* lanceolate, cuspidate-acuminate, 6in. to 9in. long, narrowed at base, scarcely petiolate, wrinkled, crenate-toothed, glabrous above, pilose beneath. Stem 14ft. or more in height; branches pubescent. New Grenada. Stove.

S. glandulosus (glandular).* *fl.* rose-coloured, nodding; calyx lobes spreading, with reflexed margins, deeply glandular-serrated; corolla tube curved, compressed, clavate, the limb segments nearly equal, erecto-patent; peduncles axillary, solitary, shorter than the leaves, one-flowered, bibracteate below the middle. July. *l.* rather long-stalked, cordate, wrinkled, doubly toothed. *h.* 3ft. Bogota, 1845. A softly pubescent, stove plant. (B. M. 4331; F. d. S. 401.)

S. hamatus (hooked). *fl.* violet, in short, dense, terminal racemes; calyx lobes hooked, spreading; corolla tube curved, laterally angular-compressed, the segments nearly equal, elongated; primary bracts hooked at apex. June. *l.* alternate, petiolate, oblong-ovate or slightly cordate, acuminate, attenuated towards the base, irregularly toothed, the nerves prominent beneath. *h.* 6ft. Brazil, 1849. A tomentose-pubescent, greenhouse plant.

S. Humboldtianus (Humboldt's).* *fl.* scarlet; calyx lobes ovate-triangular, shorter than the tube; corolla tube straight, the segments ovate-lanceolate, upper ones longer; pedicels axillary, compressed, equalling the leaves. Summer. *l.* petiolate, ovate or lanceolate, acute at both ends, argutely denticulate, glabrescent above. Branches angular, densely pubescent. *h.* 3ft. Peru, 1867. Stove. (B. M. 5631.) SYN. *S. fulgens* (F. M. 313).

S. lantanifolius (Lantana-leaved). *fl.* purplish, eight to ten together; calyx velvety; corolla narrow, incurved, with acuminate lobes; pedicels corymbose. July. *l.* ovate, acute, 1½in. long, obtuse at base, sometimes slightly cordate, shortly petiolate, glabrous and wrinkled above, fuscous-tomentose beneath, the margins denticulate. Branches straight, simple, somewhat woody, terete. *h.* 3ft. Caraccas, 1841. Stove shrub.

S. l. glabriusculus (slightly glabrous). *l.*, together with the pedicels and calyx, scarcely pubescent. (B. M. 4105, under name of *S. lantanifolius.*)

S. longepedunculatus (long-pedunculate). *fl.* purplish, on axillary pedicels longer than the leaves; calyx segments acute, much shorter than the corolla; corolla nearly 2in. long, narrow, sub-arcuate. January. *l.* alternate, ovate, acuminate, 3in. to 4in. long, membranous, cordate, petiolate, argutely toothed. Stem terete, 3ft. high. Rio de Janeiro, 1841. Stove. (B. M. 4015.) SYN. *S. fimbriatus* (R. G. 600).

S. macropodus (large-footed). *fl.* bluish-red; calyx hairy; corolla four times as long as the calyx, the tube ventricose above, the inferior lobes reflexed; pedicels almost equalling the leaves, puberulous. June. *l.* ovate, acute, 3in. long, shortly petiolate, crenate, slightly hairy above, pubescent beneath. Stem slightly branched, hairy, 2ft. to 3ft. high. Minas Geraës. Stove. SYN. *S. canus.*

S. manettiæflorus (Manettia-flowered).* *fl.* red and yellow, as long as the leaves; calyx segments subulate, serrated; corolla laterally compressed, the segments nearly equal, erecto-patent; peduncles solitary, axillary, one-flowered, bibracteate, three or four times longer than the leaves. April. *l.* very shortly petiolate, oblong-ovate, obscurely serrated, reticulated, shining above. *h.* 1ft. New Grenada, 1848. An erect, dwarf, stove sub-shrub. (B. M. 4403; P. M. B. xv. 267.) SYN. *S. nitidus* (of gardens).

S. microstoma (small-mouthed). *fl.* scarlet, shortly pedunculate, in terminal umbels; calyx segments obtuse, spreading; corolla pubescent, swollen above, laterally compressed, the segments small, linear, obtuse, connivent, pilose. September. *l.* alternate, shortly petiolate, ovate, acute, 2in. long, glandular-serrate, glabrous. Stem 2ft. to 3ft. high, glabrous; branches terete. New Grenada, 1844. An erect, stove sub-shrub. (B. M. 4286; F. d. S. 444; L. & P. F. G. ii. 44.)

S. nitidus (shining). A garden synonym of *S. manettiæflorus.*

S. Orbignianus (d'Orbigny's). *fl.* yellow and red, numerous in the upper axils; calyx lobes thrice as long as the tube; corolla much longer than the calyx, with linear lobes; pedicels half as long as the leaves. July. *l.* ternate, ovate, acuminate, shortly petiolate, unequally and acutely toothed, 3in. to 4in. long, puberulous beneath. Branches erect, terete. *h.* 2ft. or more. Bolivia, 1849. Stove. (B. M. 4713; F. d. S. 544; L. & P. F. G. i. p. iii.; L. J. F. iv. 425.)

S. penduliflorus (pendulous-flowered). *fl.* scarlet, nodding; calyx segments two or three times as long as the tube; corolla segments linear, half exceeding the tube; pedicels 1in. long; racemes terminal, solitary, long, loose-flowered. June. *l.* opposite, rather long-stalked, ovate-oblong, slightly acute, remotely serrulated, rather thick. *h.* 2ft. Caraccas, 1847. A highly glabrous, stove, climbing shrub. (F. d. S. 763.)

S. scandens (climbing). *fl.* scarlet, scattered, on pedicels two to four lines long; corolla tube nearly 1in. long, the segments falcate, sub-equal, reflexed. July. *l.* petiolate, reflexed, oblong, obtuse, 1in. to 1⅔in. long, somewhat acute at base, slightly fleshy, the margins quite entire and revolute. Stem climbing. Peru, 1847. Stove shrub.

S. surinamensis (Surinam). A synonym of *Centropogon surinamensis.*

S. villosulus (slightly hairy). *fl.* reddish-orange; corolla small, nearly straight, the segments narrow and acute; pedicels longer than the calyx; racemes terminal, many-flowered. June. *l.* alternate, oblong-lanceolate, acuminate, narrowed into the petiole, above silky, and of a pleasing green, very shortly puberulous beneath. Stem branched. *h.* 3ft. Brazil, 1832. Greenhouse. (F. d. S. 619; L. & P. F. G. ii. p. 135, under name of *S. amœnus.*)

SIPHONANDRA. A synonym of **Chiococca** (which *see*).

SIPHONANTHA. A synonym of **Clerodendron** (which *see*).

SIPHONIA. A synonym of **Hevea** (which *see*).

SIPHONIOPSIS. A synonym of **Cola** (which *see*).

SIPHONOPHORA. A genus of Aphides or Greenflies, distinguished by long, slender honey-tubes or siphons, borne on the hinder part of the body (see Fig. 489). It includes a very large number of species, several of them injurious to cultivated plants, *e.g.*, Roses.

FIG. 489. SIPHONOPHORA ROSÆ — *a*, Line showing the natural length.

SIREX. A genus of Sawflies, the larvæ of which feed in the wood of Conifers, in which they bore tunnels, often about ¼in. wide. They thus injure the trees, and ruin the wood for carpentry. Only two species are known as British; these are *S. juvencus* (the Steel-blue Sirex) and *S. gigas* (the Giant Sirex). They agree in general form. The body is nearly cylindrical. In the female, the last ring of the abdomen bears a strong spine, directed backwards; and from the lower surface of the abdomen arises a strong ovipositor, also pointed backwards, in which lies the "saw," used for boring into tree-trunks. The ovipositor is about half as long as the body. The four wings are large, powerful, and transparent. The legs and antennæ are also well developed. The length, without the ovipositor, varies from about ½in. to 1½in., but is usually over 1in. The mode of life is as follows: The female bores with her saw into the bark of trees, preferring sickly ones if they are to be found, and deposits in each hole an egg, from which, after a time, a white, soft, cylindrical larva emerges. The larva tunnels in the wood of the tree. The duration of the larval stage is uncertain. Some believe that it is

Sirex—*continued.*

passed through in a few weeks; but the perfect insects have emerged at intervals for many years from wood to which the larvæ could not have got access after the trees had been felled and sawn into planks. The larvæ have strong jaws, six very small feet near the head, and a bluntly-pointed tail. They change in their tunnels into pupæ. From these the perfect insects emerge, from July to September.

S. juvencus, or the "Steel-blue Sirex," is, as the name denotes, usually of a dark steel-blue colour, with red-brown feet; in the males, several segments of the abdomen are rusty-red. The wings, in both sexes, are yellowish, with smoky hind margin. The females are usually 1¼in. long, the males rather below 1in. This insect is not rare. It prefers Scotch Firs, though it also feeds in other Conifers.

S. gigas, or the Giant Sirex, is rather larger than the other species, from which it also differs in colour. It is ringed with black and yellow; the latter colour is duller in the males. This species is less common than the former. The larvæ are said not to attack Scotch Firs; but feed in Spruce, Silver Firs, and occasionally in Larch.

Remedies. It is not possible to destroy the larvæ in infested trees. To prevent the injury from spreading, sickly trees, and all fallen branches and trunks, should be cut up and removed; and this should be done also with all trees that show traces of serious injury, in the form of holes through which the insects have escaped. The timber of such trees is of little value, save as firewood, because of the injury done to it by the larvæ.

SIRIUM. A synonym of **Santalum** (which *see*).

SISARUM. Included under *Pimpinella.*

SISSOO-TREE. A common name for *Dalbergia Sissoo.*

SISYMBRIUM (an old Greek name, used by Theophrastus for Mint). Hedge Mustard. Including *Alliaria.* ORD. *Cruciferæ.* A genus comprising eighty species of hardy, mostly annual or biennial herbs, usually inhabiting the temperate and cold regions of the Northern hemisphere, but rarely occurring in the Southern. Flowers usually yellow, rarely white or rose, loosely racemose, rarely axillary Radical leaves stellate; cauline ones alternate. Five species are included in the British Flora: *S. Alliaria* (Garlic Mustard, Jack-by-the-Hedge, Sauce Alone), *S. Irio* (London Rocket, so called because it sprang up after the Great Fire), *S. officinale* (Bank Cress, common Hedge Mustard), *S. Sophia* (Flixweed), and *S. Thaliana* (Thale Cress). The genus has no horticultural value.

SISYRINCHIUM (an old Greek name, used by Theophrastus for the Iris). Blue-eyed Grass; Pig Root; Rush Lily; Satin Flower. SYN. *Souza.* Some of the plants included here were formerly placed under *Bobartia.* ORD. *Irideæ.* A genus comprising about fifty species of mostly hardy or half-hardy perennials, with fibrous roots; all are natives of tropical or extra-tropical America, and one has become naturalised in Ireland. Flowers many in a spathe, pedicellate; perianth with scarcely any tube, and sub-equal, obovate or oblong lobes; stamens affixed at the base of the perianth. Leaves radical or clustered at the base of the stem, linear-terete or more or less ensiform, always narrow; cauline ones few or none. Stems equal or slightly thickened at base. A selection of the species best known in gardens is given below. All thrive in a compost of sandy loam and leaf mould. Propagation may be effected by seeds, or by offsets, in spring.

S. anceps (two-headed). A synonym of *S. angustifolium.*

S. angustifolium (narrow-leaved). *fl.* of a paler blue than in *S. Bermudiana.* *l.* narrower, and whole plant smaller. Eastern United States (naturalised in New Zealand and Australia, also in Ireland). SYNS. *S. anceps*, *S. gramineum* (B. M. 464).

Sisyrinchium—*continued.*

S. Bermudiana (Bermudan). This differs from *S. angustifolium* in being much larger in all its parts, and strikingly so in its broad leaves, which are equitant at the base. *h.* 1½ft. to 2ft. Bermudas. SYN. *S. iridioides* (B. M. 94).

S. californicum (Californian). *fl.* many in succession, scentless; perianth of a uniform yellow, explanate, the segments obovate-oblong, obtuse; anthers orange-coloured; fascicle many-flowered; scape quite simple, longer than the leaves, curved. Autumn. *l.* several, distichous, 1ft. to nearly 2ft. high, about ¼in. broad, linear-ensiform. California, 1796. Half-hardy. SYN. *Marica californica* (B. M. 983).

S. chilense (Chilian). *fl.*, perianth purple, yellow at the base, three to five lines long; bracts leaf-like; spathe linear, acuminate, about three-flowered; peduncles flexuous, very slender, 1in. to 1½in. long. July. *l.*, radical ones linear-ensiform, striated, 3in. to 12in. long, one to two lines broad. Stem 6in. to 12in. high, flexuous. Brazil, &c., 1826. Half-hardy. (B. M. 2786.)

S. Douglasii (Douglas'). A synonym of *S. grandiflorum.*

S. filifolium (thread-leaved).* *fl.* campanulate, erect; perianth white, like porcelain, each segment delicately lined with pale purplish-red. May. *h.* 6in. to 8in. Falkland Islands, 1885. Plant of Rush-like habit. (B M. 6829; G. C. n. s., xxiii. p. 696.)

S. gramineum (grass-like). A synonym of *S. angustifolium.*

S. graminifolium (grass-leaved). *fl.* slightly exserted above the spathe; perianth yellow, the segments obovate, mucronate; spathes terminal, few or many-flowered, the outer one leafy, 1½in. long, the inner 1in. long. April. *l.*, radical ones 8in. long, scabrous on the margins, acuminate, sheathing at base; cauline ones 3in. to 6in. long. Stem branched, erect, 7in. to 9in. high. Chili, 1825. Half-hardy. (B. R. 1067.)

S. g. ascendens (ascending). *fl.*, spathes very hairy, equal. *l.*, radical ones 4in. to 6in. long; cauline ones 2in. to 3in. long, alternate. Stem 5in. to 9in. high. (B. R. 1914, under name of *S. g. pumilum.*)

S. g. maculatum (spotted). *fl.*, perianth segments marked with dark blood-coloured spots. (B. M. 3197, under name of *S. maculatum.*)

FIG. 490. SISYRINCHIUM GRANDIFLORUM.

S. grandiflorum (large-flowered).* Spring Bell. *fl.*, perianth dark purple, striated, the segments obcordate, unguiculate, eight to ten lines long; spathe two-flowered, erect, leafy, terminal, two-valved. May. *l.* erect, broadly linear, spreading, striated, 6in. to 8in. long, sheathing at base. Stem 8in. to 10in. long, quite simple. Root creeping. North America, 1826. A pretty hardy plant. See Fig. 490. (B. M. 3509; B. R. 1364; G. C. n. s., xxi. p. 216; R. H. 1868, p. 190; S. B. F. G. ser. ii. 388.) SYN. *S. Douglasii* (F. d. S. 146). There is a variety of this with white flowers.

S. iridifolium (Iris-leaved).* *fl.* on slender pedicels, pubescent beneath; perianth yellowish-white, the segments about ½in. long, cuneate-ligulate, slightly mucronate; spathes terminal, the outer one 1½in., the inner 1in., long, carinate; peduncles geniculate. June. *l.* linear-ensiform, incurved at apex, scabrous-ciliated on the margins; radical ones 4in. to 8in. long; cauline ones 2in. to

Sisyrinchium—*continued.*

4in. long. Stem branched, 4in. to 12in high. Brazil to Chili, 1822. Half-hardy. (L. B. C. 1979.) SYNS. *S. laxum* (B. M. 2312), *Marica iridifolia* (B. R. 646).

S. iridioides (Iris-like). A synonym of *S. Bermudiana.*

S. laxum (loose). A synonym of *S. iridifolium.*

S. lutescens (yellowish). A synonym of *S. striatum.*

S. micranthum (small-flowered). *fl.* three to ten, small, pedicellate; perianth yellow, ½in. long; spathes terminal, the outer one about 1in., the inner ½in., long. June. *l.* linear-ensiform, striated, glabrous; radical ones 1in. to 4in. long, one line broad; cauline one bract-like, 1in. long. Stem glabrous, one-leaved, simple, flexuous, 2in. to 9in. high. Mexico and Brazil, &c., 1815. Half-hardy. (B. M. 2116.)

S. striatum (striated). *fl.* nine to twelve, spicate, alternate, exceeding the ovate, cuspidate spathe; perianth yellowish, the tube two lines, the segments seven lines, long; pedicels nearly equalling the spathe. June. *l.* glabrous; radical ones about 1ft. long, distichous, equitant, sheathing; cauline ones rather remote, amplexicaul. Stem 1ft. to 2ft. high, simple or branched. Chili, 1788. Hardy. SYNS. *S. lutescens* (L. B. C. 1870), *Marica striata* (B. M. 701).

S. tenuifolium (slender-leaved). *fl.*, perianth yellow, the segments oblong, acute; pedicels sparsely hairy, exceeding the spathe; spathe two-leaved, terminal, one or many-flowered. *l.* linear-ensiform, scabrous on the margins, acuminated, striated; radical ones 2½in. to 9in. long; cauline ones 2in. to 4in. long. Stem ascending, simple or branched, 1½in. to 12in. high. Mexico, 1816. Hardy. (B. M. 2117, 2313.)

SITOCODIUM. A synonym of *Camassia.*

SITODIUM. A synonym of *Artocarpus.*

SITOLOBIUM. Included under **Dicksonia** (which *see*).

SITONA. A genus of small beetles belonging to the family of Weevils. It includes those popularly known as Pea-and-Bean-Weevils, which receive this name because of the harm they do to the Pea and Bean crops, especially in field cultivation. But they also feed on many other leguminous plants, *e.g.*, Clover. In them the beak is shorter than in most Weevils, and projects horizontally. It is flat, except for a slight channel along its upper surface. The antennæ are elbowed. The body is oblong, with the thorax a good deal narrower than the abdomen. The beetles are about ⅕in. or a little more in length. Their ground-colour is black; but this is almost always more or less concealed by a coat of ochreous, grey, or rosy scales and hairs. These scales and hairs are apt to be rubbed off, and to disappear after a time. The most hurtful species are *S. crinita*, the Spotted Pea-weevil, and *S. lineata*, the Striped Pea-weevil. The former bears ten punctured stripes down the wing-cases, these stripes being alternately dark and light ochreous. The former species is a little smaller than *S. lineata*, is more grey or rosy than that insect, and has a few dark spots on the wing-cases. Both have the limbs, for the most part, dull-red.

The beetles feed on Peas, Beans, and other leguminous plants, gnawing the young leaves and leaflets from the margins inwards, and, in this way, sometimes completely destroy the crops, if the weather is cold and unfavourable to growth after the young plants have come through the soil. Strong, healthy plants suffer least from them. The life-history of these Weevils has been followed out, within the past three or four years, by Messrs. Hart and Christy. The larvæ feed on the roots of Clover, and, it may be presumed, of other *Leguminosæ*. They have been observed of all sizes and ages in the autumn, and many of them live through the winter as larvæ, and reach their full size in spring. When full-grown, they are footless, wrinkled, white maggots. They become pupæ in oval, earthen cells, 1in. to 2in. below the surface of the soil; and in two or three weeks they emerge as beetles. It would thus seem that the larvæ are injurious; but the beetles are far more so. They are apt to remain undetected in their depredations, as, when in danger, they drop at once from the plants to the soil and hide under particles of earth, &c.; but pressure, or stamping with the feet, on the soil around the plants, makes the beetles

Sitona—*continued.*

come out in swarms. They seem to pass the winter in open ends of stubble, or in any other convenient retreat.

Remedies. The best is probably to make up the seed-bed so as to be favourable to rapid and healthy growth of the young plants, thus rendering them able to survive the attacks of the Weevils. For the same reason it is well to water the plants in dry weather. It is recommended also to lay wood-ashes or coal-ashes along the drills above the rows of Peas or Beans, as this favours growth. Rolling the ground brings the Weevils to the surface, and kills many of them. Applications of lime or soot to the wet leaves renders these distasteful to the insects; but the most useful application yet tried is paraffin, in a solution of about two ounces to one gallon of water, with which the plants should be watered.

SIUM (from *Sion*, the old Greek name, used by Dioscorides). Water Parsnip. ORD. *Umbelliferæ.* A small genus (four species) of glabrous, hardy herbs, natives of North temperate regions, South Africa, and St. Helena. Flowers white, in compound umbels; involucral bracts numerous. Leaves pinnate; pinnæ toothed. *S. angustifolium* and *S. latifolium* are British plants. *S. Sisarum* (Skirret) is removed, by Bentham and Hooker, to *Pimpinella.* The species possess no horticultural value.

SKIMMIA (from *skimmi*, a Japanese word, signifying a hurtful fruit). ORD. *Rutaceæ.* A genus comprising about half-a dozen species of pretty, hardy, evergreen, highly glabrous shrubs, with green branchlets, natives of the Himalayas and Japan. Flowers whitish, clustered; calyx short, four or five-lobed; petals four or five, oblong, much longer than the calyx, valvate or loosely imbricated; disk inconspicuous; panicles terminal, branched. Drupes ovoid, fleshy, two to four-stoned. Leaves alternate, simple, petiolate, lanceolate, entire, coriaceous, pellucid-dotted. The species thrive in a compost of peat and loam. Propagation may be effected by cuttings, inserted in sand, under a bell glass, in gentle heat; and by seeds, sown, when ripe, in sandy loam and peat.

FIG. 491. TIP OF BRANCH, WITH INFLORESCENCE, OF SKIMMIA FRAGRANS.

S. fragrans (fragrant). *fl.* white, fragrant, disposed in terminal panicles. *l.* elliptic-oblong, thick. *h.* about 3ft. See Fig. 491. (R. H. 1880, p. 56, Fig. 11.) Of this garden plant only the female is at present known.

Skimmia—*continued.*

S. fragrantissima. *See* **S. oblata.**

S. intermedia (intermediate). *fl.* white, rosy on the outside, scented, disposed in spike-like panicles. Spring. *l.* narrow-elliptic, coriaceous, deep green. 1870. A much-branched and compact, garden variety, intermediate between *S. fragrans* and *S. japonica.*

FIG. 492. BRANCHLET, WITH FLOWERS AND FRUITS, OF SKIMMIA JAPONICA.

S. japonica (Japanese).* *fl.* white, resembling those of some Hollies, deliciously scented; petals spreading; panicles thyrsoid, pedunculate, broadly-oblong, many-flowered. *fr.* roundish-oval, bright red. March. *l.* alternate, but here and there crowded, so as to appear sub-verticillate, oblong, acuminated, entire, pellucid-dotted, tapering into short footstalks. *h.* rarely above 3ft. or 4ft. Japan, 1845. A very handsome shrub when in full berry. See Fig. 492. (B. M. 4719; G. C. n. s., xxv. p. 244; I. H. 1854, 13; L. & P. F. G. ii. 163; S. Z. F. J. 68.)

S. j. argentea variegata (silvery-variegated). *l.* oblong, acuminated, broadly and unequally bordered with white. 1875

FIG. 493. BRANCHLET IN FLOWER AND FRUIT, AND DETACHED FLOWER, OF SKIMMIA OBLATA VEITCHII.

Skimmia—*continued.*

S. Laureola (Laureola).* *fl.* pale yellow, very fragrant, densely disposed in terminal, compact corymbs; rachis and peduncle purple-dotted. Spring. *fr.* ovate, smooth, nearly as large as an olive. *l.* approximating at the tips of the branches, sub-opposite or ternate, oblong-lanceolate, acute, attenuated at base, entire, 3in. to 5in. long, dark green above, yellowish beneath. *h.* 4ft. Nepaul. A very pretty, Citron-scented shrub. SYN. *Limonia Laureola.*

S. oblata (oblate-berried).* *fr.* very bright vermilion-red, oblate, glossy, borne in panicled clusters. *l.* firm, smooth, elliptic-obovate, bright green. Japan, 1864. (G. C. n. s., xxv. p. 245.) A remarkably beautiful, dwarf shrub, of dense habit. The male or pollen-bearing plant is known in gardens by the name of *S. fragrantissima.*

S. o. Veitchii (Veitch's). *fl.* hermaphrodite or monœcious, in spike-like racemes; petals dirty-white. Spring. *fr.* spherical, of a beautiful coral-red. *l.* flat, elliptic, oboval, glossy, narrowed into a thick petiole. *h.* 3ft. See Fig. 493. (R. H. 1880, p. 57, fig. 13.)

S. ovata (ovate). This appears to be a garden form of *S. japonica*, with larger, broader leaves than the type.

FIG. 494. FLOWERING BRANCHLET, AND PORTION OF DETACHED INFLORESCENCE, OF SKIMMIA RUBELLA.

S. rubella (reddish).* *fl.* greenish-white, disposed in thyrses, odorous; buds tinted with red, hence the name. *l.* lanceolate-elliptic, leathery. China, 1874. See Fig. 494. (R. H. 1874, 311; 1880, p. 57, fig. 12; 1885, p. 189.)

SKINNERIA. Included under *Ipomœa.*

SKIOPHILA. Included under **Episcia** (which *see*).

SKIPJACKS. *See* **Wireworms.**

SKIRRET (*Sium Sisarum*). A perennial, cultivated, but not extensively, for its roots, which are rather large, and composed of fleshy, tuberous prongs joined together, as shown in Fig. 495. Leaves pinnatisect; segments oblong-acute serrate; involucre five-leaved, reflexed. The roots are white, and are cooked and served in a similar way to those of Salsafy. Skirret may be propagated by slipping off the side roots before growth commences in spring, and dibbling them in ordinary garden soil, but it is generally increased by seeds. These should be sown in drills, about 1ft. apart, early in April, and the seedlings thinned, when large enough, to 6in. or 8in. asunder. A rather light soil, which has not been very lately manured, is best suited to the requirements

MISSOURI BOTANIC GARDEN

Skirret—*continued.*

of Skirret. The roots may be used from the end of September onwards, through the winter; before growth commences in spring, they should be lifted and stored in moderately dry sand.

FIG. 495. TUBEROUS ROOTS OF SKIRRET.

SKIRWORT. An old name for **Skirret** (which *see*).

SKULL CAP. *See* **Scutellaria.**

SKUNK CABBAGE OR WEED. *See* **Symplocarpus fœtidus.**

SLASHED. The same as **Laciniate** (which *see*).

SLATERIA. A synonym of **Ophiopogon** (which *see*).

SLIPPER FLOWER, or **SLIPPERWORT.** *See* **Calceolaria.**

SLIPPER, LADY'S. *See* **Cypripedium.**

SLIPPER SPURS. *See* **Pedilanthus.**

SLIPPERWORT. *See* **Calceolaria** and **Campanula.**

SLIPS, PROPAGATION BY. A term used in reference to plant-propagation in cases where a specimen may be taken up and divided into several pieces, each of which shall have roots attached, and be capable of forming a plant itself when placed under the proper conditions. Common Box is referred to as an example of a plant that may be increased in almost any quantity from Slips. There are many other subjects which may be similarly propagated.

SLOANEA (named in honour of Sir Hans Sloane, born in Ireland in 1660, President of the Royal Society, founder of the British Museum and the Chelsea Botanic Garden; he died in 1753). ORD. *Tiliaceæ.* A genus comprising about thirty species of stove, tropical American trees. Flowers racemose, panicled, or fascicled, axillary or terminal, rarely solitary; sepals or calyx lobes four or five, valvate, rarely coalescing; petals absent, or very rarely one to four, sepaloid; stamens numerous. Leaves alternate or sub-opposite, entire or toothed, penninerved. The two species introduced are fine trees, with large leaves. A compost of loam and peat is most suitable. Propagated by cuttings of ripened wood, inserted in sand, under a glass, in heat.

S. dentata (toothed). *fl.* white, large. August to November. *l.* ovate, acute, bluntly toothed; stipules cordate-triangular, serrated. *h.* 50ft. 1752.

S. sinemariensis (Sinemaria). *fl.* white, small; racemes axillary. July and August. *l.* roundish-ovate, entire, 1ft. long; stipules long, acuminated, deciduous. *h.* 50ft. 1820.

SLOE. *See* **Prunus spinosa.**

SLOPES. In gardening, any piece of land on an inclined plane may be called a Slope; but the term is most generally used in reference to lawns when they are naturally or artificially undulated. Grass or lawn Slopes have to be laid out much in accordance with the space they occupy, and the disposition of the land above and below them. In forming Slopes, the land should be made equally firm throughout, to prevent one part subsiding more than another after the work is finished; a practised eye is one of the principal helps in rendering the surface and incline uniform. When alterations are in progress, the formation of a Slope often saves an immense amount of work, by utilising spare soil or forming an undulating surface of that naturally placed, instead of carting it away. Gardens situated on sloping ground have an advantage in being more readily drained than if they were on the level, they are also much better situated, provided the aspect is favourable for exposure to the sun.

SLOW-MATCH TREE. A common name for *Careya arborea.*

SLUGS. These molluscs are only too well known to everyone, because of the injury done by them to almost all kinds of garden produce. They are especially partial to young, newly-opened leaves of salad plants, *e.g.*, Lettuce; but they also eat holes in Carrots, Turnips, and other fleshy roots, and are frequently very troublesome among flowers, not only in borders, but also when potted. Slugs are far less frequently seen than might be expected from their extreme abundance, because of their habit of living concealed, during dry weather, by day, and coming out only after a shower, or at night. Several species are very common. The more important and destructive of these are the following: *Arion ater*, the Black Slug, is usually more common by roadsides and in waste places than in gardens; this animal is usually black, though sometimes reddish, but its form and general aspect are easily recognised, whatever the colour. *A. hortensis*, the Garden Slug, is also common, but is smaller and more slender, and shows grey stripes lengthwise. *Limax maximus* is our largest Slug, some specimens being 6in. long when stretched out. This species, when full grown, is easily known by its size, but is not abundant anywhere, though more common than it seems. It is spotted and streaked with black. *L. flavus*, the Yellow Slug, and *L. agrestis*, the Field Slug, are very common all over the country; and *L. arborum*, the Tree Slug, and *L. Sowerbii*, the Keeled Slug, are plentiful in some parts of Britain. In all the Slugs of the genera *Arion* and *Limax*, the body seems quite naked, the shell being reduced to a small, useless vestige, inclosed in the swollen part in front, known as the mantle. By all of them, in common with most molluscs, the tongue is used for cutting their food; it is a long belt, or riband, bearing cross rows of small, horny teeth; as these are worn away on the front of the riband, it is renewed by growth behind. The number and forms of the teeth, and the development of the shell, are of great use in distinguishing the species of Slugs. They all move about by means of contractions and elongations of the broad, flat, lower surface, or foot.

Remedies. Among the most effectual are baits, such as cabbage or lettuce leaves, hollowed slices of apples, carrots, potatoes, or turnips, laid near the plants that peculiarly need protection. These traps should be frequently examined, and the Slugs knocked off into ammoniacal solution, *e.g.*, gas-water; or they may be covered with quicklime, or with wood-ashes, salt, or soot. All these latter applications require to be repeated once at least, as the Slugs resist their action by throwing out a thick coat of slime, from which they can crawl out not much the worse; but they seem unable to repeat this operation

Slugs—*continued.*

immediately, if they are covered with the materials a second time. A ring of quicklime or of soot on the soil around choice plants, forms a protection against injury by Slugs, which will not cross these substances. A successful method of destroying Slugs is to water the soil with solution of ammonia; this brings them out, and usually kills them; and, in any case, they are rendered white and conspicuous, and can easily be picked up and put into a vessel for removal. Hand-picking is most effectual in moist evenings; but this method is slow and irksome, though effectual with potted plants. Trees may be protected against the ascent of Slugs to the fruit, by tying a new horsehair rope round the stem, or by putting a layer of quicklime or soot, &c., on the soil round the trunks. The layer should be renewed as required.

Slugs and Snails can lower themselves from branches, by threads formed of the thickened slime in which they are enveloped. One genus of Slugs, found in various places in the South of England, may be regarded as useful in gardens; this is *Testacella*, represented in England by *T. haliotidea*, and near Bristol by *T. Maugei*, which was naturalised, and has recently become abundant there. These two species live on earthworms, which they follow into their burrows. They are easily known by the existence of a small shell on the hind part of the body. *See* **Testacella.**

SLUGWORMS. By this name are denoted the larvæ of certain Sawflies belonging to the genus *Eriocampa*, and characterised by their slug-like form and habits. The larvæ have the body covered with a secretion, which on some is white, and flaky or powdery, while on others it is dark green or black, and slimy, increasing their likeness to miniature slugs; on the larvæ of some species it is yellowish, and is but small in amount. The Sawflies are small, with short, stout, black and glossy bodies. The legs are black, with the tibiæ and tarsi marked with rings varying from white to a more or less yellow tint. The antennæ are short, and thickened in the middle. The arrangement of cells in the neuration of the fore wings is also characteristic. The more common species are the following: *E. annulipes*, feeding on the lower surface of the leaves of Lime, Oak, Birch, and Willow; *E. limacina* (*Selandria Cerasi* in Miss Ormerod's "Manual of Injurious Insects"); *E. ovata*, feeding on Alder; and *E. Rosæ*, the larvæ of which feed on the upper surface of leaves of Roses, and gnaw away the epidermis. The larvæ of *E. limacina* are pre-eminently *the* Slugworms, because of their form, dull colour, sluggish habits, dark, slimy excretion, and general appearance. The damage done by them to the leaves

FIG. 496. ERIOCAMPA LIMACINA (the Larva of this is the Slugworm of fruit-trees)—*a*, Line to show actual spread of wings.

of fruit-trees is, at times, very great. This Sawfly (see Fig. 496) is about ⅕in. long, and is black and shining, but hairy; the tibiæ are yellow-brown or brownish; the wings are transparent, except a broad, smoky band in the middle. The eggs are laid on the lower surface of the leaves. The larvæ, when newly-hatched, are white, but soon become greenish-yellow, with a black head. The whole body is covered with a dark, resinous secretion. In form, it is broader just a little behind the head, which is over-arched by a hump; from this point it tapers rapidly backwards. At the last moult, the

Slugworms—*continued.*

resinous coat is thrown off, and the head becomes coloured like the body. The larvæ feed on a great variety of trees and shrubs, chiefly among *Rosaceæ*, *e.g.*, Almond, Apple, Bramble, Cherry, Hawthorn, Pear, Plum, &c.; but they also live sometimes on Birch, Oak, &c. They congregate, in companies of three or four, on the upper surface of the leaf, feeding on the epidermis only; but the whole leaf becomes brown, dead, and shrivelled, and at last falls off. The larvæ are very voracious, and are also very sluggish in their habits. They may be found during autumn. When full-fed, they fall to the ground, burrow into it, and there spin black cocoons for their protection while in the pupa stage.

Remedies. Many remedies have been employed. The best is hellebore, mixed with water, poured from a watering-pot on the larvæ. Tobacco-water, and lime-water, with about 1lb. of soft soap to fifteen gallons of the fluid, are recommended; and soapsuds by themselves have been found useful. The pupæ may be destroyed, in winter, by skimming the surface soil, to a depth of 3in. or 4in., from below the trees and bushes infested by the insects, and burning it. The Sawflies are sluggish, and can be caught by shaking or beating the plants over an umbrella or sheet, or tarred boards. They are abundant throughout Europe and in North America, and are said to have been introduced into New Zealand.

SMALL ERMINE MOTH. *See* **Hawthorn Caterpillars.**

SMALL FLAX LILY. *See* **Phormium Cookianum.**

SMALL STAG BEETLE. *See* **Lucanus.**

SMEATHMANNIA (named after Smeathmann, a naturalist, who travelled in Africa, and collected many botanical specimens). SYN. *Bulowia.* ORD. *Passifloreæ.* A genus comprising four species of beautiful, stove, evergreen shrubs, with robust, terete branchlets, natives of Western tropical Africa. Flowers white, inodorous, rather large, axillary, sub-solitary, shortly pedunculate, bibracteolate; calyx with a very short tube, and five oblong lobes; petals five, slightly longer than the calyx; corona coriaceous, ciliated, urceolate, crenulated or lobed; stamens about twenty. Leaves oblong, coriaceous, serrated; petioles bearing one to four glands at the apex. The species, two of which have been introduced, are remarkable for their erect habit, in a natural order including so many creepers and twiners. A compost of loam, peat, and sand, is best suited to the requirements of these shrubs. Propagation may be effected by half-ripened cuttings, inserted in sand, under a glass, in heat.

S. lævigata (smooth-stalked). *fl.* curved downwards; petals oblong, spreading, as well as the calyx; stamens and pistil elongated, on a short, thick stipes. July. *l.* alternate, somewhat distichous, coarsely serrated, tapering at the base into a short petiole. Branches spreading. *h.* 6ft. 1823. (B. M. 4194.)

S. pubescens (downy). *fl.* large, on short, axillary peduncles; sepals and petals acute and spreading; stigmas downy. February. *l.* alternate, shortly petiolate, oblong, glossy, acute, penninerved, sinuately dentate, obtuse at the base; petioles scarcely two lines long, with very conspicuous glands. Branches terete; young ones, as well as the petioles, midribs of the leaves beneath, peduncles, and sepals, ferruginously hairy. *h.* 6ft. 1845. (B. M. 4364.)

SMEGMADERMOS. A synonym of **Quillaja** (which *see*).

SMILACEÆ. A tribe of *Liliaceæ.*

SMILACINA (a diminutive of *Smilax*, to which genus, however, the plants bear little resemblance). False Solomon's Seal. SYNS. *Asteranthemum, Jocaste, Medora, Neolexis, Polygonastrum, Sigillaria, Tovaria.* ORD. *Liliaceæ.* A genus embracing nearly a score species of mostly hardy perennials, natives of North and Central America, and temperate and mountainous Asia. Flowers small, on short pedicels; perianth at length deciduous,

Smilacina—*continued.*

the segments distinct or shortly connate towards the base; stamens six; inflorescence terminal, shortly pedunculate, racemose or forming a simple panicle; bracts small or obsolete. Leaves alternate, very shortly petiolate, ovate, lanceolate, or rarely narrow. The best-known species are described below. They succeed in any light soil, and may be readily increased by divisions.

S. bifolia (two-leaved). A synonym of *Maianthemum bifolium.*

S. borealis (Northern). A synonym of *Clintonia borealis.*

S. canadensis (Canadian). A synonym of *Maianthemum bifolium.*

S. oleracea (culinary).* *fl.* in a deltoid, terminal panicle, minutely bracteate; perianth white, tinged with rose outside, globose, about ¼in. long and broad; pedicels ¼in. long, deflexed or ascending. May. *fr.*, berry rose-purple, with dark spots. *l.* 6in. to 7in. long, alternate, oblong-acuminate, minutely pubescent beneath. Stem sub-erect, simple. *h.* 4ft. Sikkim, 1877. (B. M. 6313, under name of *Tovaria oleracea.*)

S. racemosa (racemose). False Spikenard. *fl.* on solitary pedicels; perianth whitish, one line long; panicle oblong or deltoid, shortly pedunculate, 2in. to 6in. long, the branches dense-flowered, ascending. May. *l.* ten to fifteen, ascending, oblong or lanceolate, acuminate, 3in. to 9in. long, paler and puberulous beneath. *h.* 2ft. to 3ft. North America, 1640. (B. M. 899, under name of *Convallaria racemosa.*)

S. stellata (star-like).* Star-flowered Lily of the Valley. *fl.*, perianth white, two to three lines long; racemes somewhat dense, ten to twenty-flowered, very shortly pedunculate, 1in. to 1½in. long. May. *l.* six to fifteen, ascending, oblong or lanceolate, 2in. to 6in. long, acute or acuminate, sessile and semi-amplexicaul, glaucous and puberulous beneath. *h.* 1ft. to 2ft North-west America, 1633. (B. M. 1043 and L. B. C. 1080, under name of *Convallaria stellata.*)

S. uniflora (one-flowered). A synonym of *Clintonia uniflora.*

SMILAX (the ancient Greek name used by Theophrastus). American China Root. TRIBE *Smilaceæ* of ORD. *Liliaceæ.* This genus embraces, according to Alph. de Candolle, 187 species of stove, greenhouse, or hardy, sarmentose shrubs, rarely dwarf and sub-herbaceous, broadly dispersed over temperate and tropical regions. Flowers small, diœcious, pedicellate, in umbels (or cymelets), often numerous; stamens of the males six, rarely indefinite; staminodes of the females six or fewer; umbels pedunculate or sessile, axillary or terminal. Leaves alternate, distichous, or rarely opposite, often perennial; petioles furnished with two tendrils; floral leaves usually reduced to bracts. *Smilax* is, on the whole, one of the most important genera from an economic standpoint. The roots of several species constitute the well-known Sarsaparilla of our shops. The rootstocks of *S. China* are eaten by the Chinese; and those of *S. Pseudo China* are used in the manufacture of a kind of beer in South Carolina. A selection of species grown in gardens is given below. They boast of no particular beauty, but are plants of considerable interest, and mostly hardy. A sandy-loam soil is best adapted to their requirements. Propagation may be effected by divisions of the root.

S. aspera (rough).* Prickly Ivy. *fl.* whitish or flesh-coloured, fragrant; spikes longer or shorter than the leaves. July. *l.* frequently cordate at base, hastate- or deltoid-lanceolate, acuminate or cuspidate, sometimes white-spotted. Stems prickly. *h.* 5ft. to 10ft. South Europe, &c., 1648. (S. F. G. 959.)

S. a. angustifolia (narrow-leaved). *l.* narrow, elongated. (L. B. C. 1799, under name of *S. sagittæfolia.*)

S. a. mauritanica (Mediterranean).* *fl.* greenish-yellow, fragrant. A very beautiful, half-hardy, evergreen climber, of considerable size, well suited for conservatory decoration. 1884. (G. C. n. s., xxii. p. 185.)

S. a. punctata (spotted). A variety having the leaves spotted with white. (R. G. 683.)

S. asperrima (very rough). A garden name for a plant which at present cannot be determined.

S. auriculata (auricled). *fl.* small, very fragrant. *fr.*, berry small, globular. *l.* green, glossy, and widened at the base so as to become sub-hastate; the front portion three-nerved, with two short, additional nerves in the widened basal angles. Stems striated, freely furnished with short, white, recurved spines. Southern United States, 1884. An elegant, half-hardy, evergreen climber.

Smilax—*continued.*

S. australis (Southern). *fl.* white, or pale green or purple; umbels many-flowered, on axillary peduncles. Summer. *l.* from ovate-lanceolate or oblong to nearly orbicular, 2in. to 4in. long, or rarely much larger; petioles short and twisted. Stems and branches usually more or less armed with scattered prickles. *h.* 3ft. to 5ft. or more. Australia, 1791. SYN. *S. latifolia.*

S. Bona-nox (Good-night). *fl.* greenish-white; peduncles longer than the petioles. June and July. *l.* tardily deciduous, varying from round-cordate and slightly contracted above the dilated base to fiddle-shaped and halberd-shaped or three-lobed, green and shining on both sides, cuspidate-pointed, the margins often somewhat bristly-ciliate or spinulose. Branches and branchlets sparsely armed with small, rigid prickles. *h.* 5ft. to 10ft. North America, 1739. SYN. *S. tamnoides.*

S. B.-n. hastata (halberd-shaped). *l.* narrower than in the type, thickly beset with prickles on the margins. 1820.

S. B.-n. rubens (reddish). *l.*, tendrils purplish. Branches sparsely prickly. (W. D. B. 108, under name of *S. rubens.*)

S. China. China Root. *fl.* greenish-white; peduncles much shorter than the leaves, longer than the petioles. August. *l.* deciduous, ovate-rounded, the young ones abruptly narrowed and acute at the base, at length sub-cordate, acute, cuspidate, or retuse at apex, entire. *h.* 20ft. China and Japan, 1759. The edible root is very large, fleshy, and reddish.

S. discolor (discoloured). *l.* about 9in. long and 4in. broad, oblong-ovate, suddenly acuminate, firm, irregularly blotched when young with purplish-brown, five-nerved. Mexico.

FIG. 497. SMILAX ORNATA.

S. glauca (glaucous). *fl.* greenish-white; peduncles longer than the petioles, flattened. July. *l.* tardily deciduous or partly persistent, ovate, rarely sub-cordate, glaucous beneath, and sometimes also above (as well as the young branchlets), abruptly mucronate, the edges smooth and naked. Branches terete, and, as well as the somewhat quadrangular branchlets, armed with scattered, stout prickles, or naked. *h.* 3ft. North America, 1815. (B. M. 1846; W. D. B. 111, under name of *S. Sarsaparilla.*)

S. glycyphylla (sweet-leaved). Botany Bay Tea and Tree *fl.*, perianth nearly globular in bud; peduncles axillary and simple, or a few of the upper ones in a terminal panicle. Summer. *l.* lanceolate or ovate-lanceolate, 1½in. to 3in. long or rarely more, acute or acuminate, narrowed or rounded, or rarely almost cordate at base, rigid, often glaucous or white beneath, sometimes green on both sides; petioles twisted, bearing slender tendrils. Australia. Plant glabrous, unarmed. Greenhouse.

S. herbacea (herbaceous). Carrion Flower. *fl.* carrion-scented; peduncles elongated, 3in. to 4in., or sometimes 6in. to 8in., long, twenty to forty-flowered. June. *l.* much shorter than the peduncles, long-petiolate, membranous, ovate-oblong or rounded, mostly cordate, mucronate-tipped, smooth. Stem herbaceous,

Smilax—*continued.*

never prickly, erect and recurved, or climbing. North America, 1699.

S. h. Simsii (Sims'). *l.* ovate-acuminate, sub-acute or obtuse at base, small. (B. M. 1920, under name of *S. herbacea.*)

S. lanceolata (lance-shaped). *fl.* greenish-white; umbels sometimes panicled; peduncles short, seldom exceeding the petioles, terete. June and July. *l.* thinnish, rather deciduous, varying from ovate-lanceolate to lanceolate-oblong, narrowed at base into the short petiole, shining above, paler or glaucous beneath, many of them without tendrils. Branches terete, unarmed. *h.* 15ft. to 20ft. North America, 1785.

S. latifolia (broad-leaved). A synonym of *S. australis.*

S. macrophylla maculata (large-leaved, spotted). A synonym of *S. ornata.*

S. marmorea (marbled). A garden name for a plant which probably belongs to *S. ornata.*

S. officinalis (officinal). *fl.* unknown. *l.* oblong, slightly acute at base, abruptly acuminate at apex, membranous, 5in. to 7½in. long; petioles 2in. to 5in. long, the margins inflexed, sheathing. Young branches sub-cylindric, becoming somewhat quadrangular, armed with reflexed prickles. Chiriqui, &c., (about) 1866. (B. M. Pl. 289.)

S. ornata (adorned).* *l.* ovate, acuminate, at length cordate at base, freely spotted with silvery-grey on a deep green ground, the marking being confined to the spaces between the veins; petioles prickly at back. Branches angular, armed with short prickles. Native place unknown, 1865. A handsomely-marked, greenhouse species. See Fig. 497. (I. H. 439.) SYN. *S. macrophylla maculata.*

S. Pseudo-China (false China). *fl.* greenish; peduncles two to four times the length of the petioles. July. *l.* 3in. to 5in. long, ovate-cordate, or on the branchlets ovate-oblong, cuspidate-pointed, green on both sides, often rough-ciliated, thin, becoming firm in texture. Stems and branches unarmed, or with a very few weak prickles. North America, 1739.

S. quadrangularis (four-angled). A synonym of *S. rotundifolia.*

S. rotundifolia (round-leaved).* *fl.* greenish; peduncles flattened, rather longer than the pedicels, few-flowered. June. *fr.* blue-black, globular. *l.* thin, ovate or round-ovate, entire, 2in. to 4in. long, abruptly pointed, mostly rounded or slightly cordate at base. Stem climbing high, armed with scattered prickles. North America. (T. S. M. 610.) SYN. *S. quadrangularis* (W. D. B. 109).

S. salicifolia variegata (variegated Willow-leaved). *l.* elliptic-lanceolate, finely marbled with white between the ribs, and thus appearing to be marked with four irregularly-margined, white bands, very ornamental. Branches angular, rarely sub-terete, armed with recurved prickles. Para, 1867. Greenhouse. (I. H. 521, under name of *S. longifolia foliis-variegatis.*)

S. Shuttleworthii (Shuttleworth's). *l.* large, cordate, acuminate, deep green, marked with confluent blotches of silvery-grey, the young ones purplish at back; petioles curiously deflexed at base. Columbia, 1877. A free-growing, stove climber.

S. tamnoides (Black Bryony-leaved). A synonym of *S. Bona-nox.*

SMITHIA (named in honour of Sir James Edward Smith, 1759-1828, F.R.S. and P.L.S., founder of the Linnean Society, author of "English Botany," "Flora Britannica," and other works). ORD. *Leguminosæ.* A genus comprising about a score species of stove herbs, sub-shrubs, or shrubs, inhabiting tropical Asia and Eastern Africa. Flowers mostly yellow, rarely purple or violet streaked with yellow, often in unilateral, axillary racemes; calyx deeply cut, the lobes connate in two lips; standard sub-orbicular, shortly clawed; keel incurved, obtuse, or slightly rostrate; bracts and bracteoles scarious or striated, persistent. Pods folded back into the calyx. Leaves impari- or abruptly pinnate; leaflets small, often falcate, exstipellate; stipules membranous or scarious, persistent. *S. purpurea*, the only species which calls for description in this work, requires culture similar to **Mimosa** (which *see*).

S. purpurea (purple). *fl.* purple, the round standard and the wings marked with white spots; bracts ovate, ciliated; peduncles bristly, equalling the leaves. Summer. *l.*, leaflets oblong, long-apiculate, ciliated; stipules adnate, ovate, terminated by a bristle. Stem erect, branched, glabrous. *h.* 6in. to 12in. East Indies, 1848. Annual. (B. M. 4283.)

SMOKE. Except in towns, or in the immediate neighbourhood of smelting-furnaces and coke-ovens, or (though to a less degree) of brickworks and limekilns, Smoke can scarcely be regarded as hurtful to gardens and plantations. In and around large cities, particularly in the manufacturing districts of England and Scotland, the air is charged with soot, in either a fine or a coarse state of division. The soot consists chiefly of carbon, and along with it small quantities of various compounds (empyreumatic oils, &c.) formed in the combustion of the fuel. All are familiar with the black coating that settles on everything from an atmosphere polluted with Smoke. This coating upon leaves and twigs is injurious by clogging the stomata, or small openings through which air passes into the tissues; and it also hinders the work of the leaves by shutting out part of the light that they should receive to keep them in health, and to fit them to supply the plants with food. This source of danger can be overcome by keeping the plants clean by syringing, or by washing those that are so delicate as to require special care, and so valuable as to deserve the labour. Nor is the danger so frequent as might be imagined from the prevalence of a black, sooty deposit on plants, even those in greenhouses, since these deposits are far oftener composed of Fungi (*Fumago*, &c.) than of soot. Moreover, the presence of Carbonic Acid (the most abundant product of combustion) in the atmosphere is necessary to green plants, of which it is a most important food.

The real danger to plants in the vicinity of towns and smelting-works arises from the presence, in the gases formed during combustion, of poisonous products, of which Sulphurous Acid gas is by far the worst. Its presence is due to the existence of sulphur in the coal as an impurity. Hardly any coal is free from sulphur; and its compound, Iron Sulphide or Pyrites, may often be seen as a yellow, shining coat on the smooth sides of lumps of coal. The leaves of plants show traces of poisoning by Sulphurous Acid gas, when the proportion in the atmosphere does not exceed 1 in 1,000,000 parts, if exposed to this mixture for a considerable time; and Stockhardt found that Clover and grasses showed its effects when exposed twice, for two hours each time, to 1 part in 40,000, the leaves becoming brown at the tips, and the plants withering. But the experiments are usually carried on with plants in confined air, under bell glasses; and it must be remembered that, in the open air, plants are seldom exposed to the *continuous* action of the gas, and that the danger is, therefore, considerably less than the amount of gas occasionally contained in the air would indicate. It has been found that the leaves of plants poisoned with Sulphurous Acid gas show, at first, translucent spots between the veins. These spots become dull green, and then brown, dry, and shrivelled. When water is copiously supplied to the roots, drops of water often stand along both sides of the larger veins of the leaves. Along the veins extend green borders, which form a network in the brown, dry leaves. The cells of the green parts retain abundance of fluid. This green network is an indication of the cause of harm; and chemical analysis of the leaves affords a proof of the presence of sulphur in excess, and confirms the indication given by the colour. The leaves of Conifers become dull green at the tip; then this changes into brown-red, sharply separated from the green parts below. But in these leaves the effect is very similar to that of frost, or other causes of injury; and the only certain indication is given by chemical analysis, proving the presence of excess of sulphur. Conifers are found to suffer most severely from the action of the gas, as their leaves are less readily renewed. Herbs, under similar exposure, suffer more than ordinary deciduous trees. Plants are injured less by exposure to the gas during darkness, and least of all during winter, when growth has ceased for a time. Limekilns are not so hurtful as smelting-furnaces, since the gas combines with the lime, and forms Sulphate of Lime, which prevents its escape in a hurtful form. Another injurious substance in the

Smoke—*continued.*

fumes from some works, is Hydrochloric Acid gas, which is emitted during the formation of various chemical products. The only thorough remedy is the stoppage of the emission of the gases; but the harm may be lessened by restricting these injurious processes to winter, or to the night time if they must go on in summer.

SMOKE-PLANT. *See* **Rhus Cotinus.**

SMOKE-WOOD. A common name for *Clematis Vitalba.*

SMOOTH FLOWER. A popular name for *Leianthus longifolius*, and other species.

SMOOTH-FRUITED HORSE CHESTNUT. *See* **Pavia.**

SMUT. The name given to a group of Fungi which grow among the tissues of the stamens, ovaries, and leaves of many plants, but especially infest the Cereals (*e.g.*, Barley and Oats) and other grasses. The scientific name of the group is *Ustilaginei* (from *ustus*, scorched), and refers to the scorched appearance of ears of Corn, or of other parts of plants, infested with the Fungi. The name Smut also refers to the dirty, sooty aspect of the Fungi. In the early stages, they consist of interwoven masses of mycelium, the threads of which bear numerous spores, either in a group on the tip of each thread, or singly on slender branches along their sides, near the tips. The spores vary a good deal in the different genera, some being one-celled, others made up of cells grouped together to form a rounded mass, each cell in which may be fit to produce a new plant, or only the central cell may be fit to do so, the outer ones being sterile. In most of the species, the spores are more or less deeply coloured, and in the typical Smuts they are dark brown individually, and sooty-black when in masses. The outer tissues of the host-plant are usually torn open by the pressure of the ripening spores, and the dark, powdery masses of spores are displayed and become very conspicuous. It does not fall within the scope of this work to discuss the Smuts that attack grasses, serious though their effects frequently are. Few flowering plants are liable to much injury from the Fungi of this group. *Ustilago violacea* destroys the anthers of a good many species of *Caryophylleæ*, *e.g.*, *Dianthus Carthusianorum*, *D. superbus*, *Saponaria officinalis*, various species of *Silene*, &c.; the spores are one-celled, roundish, and pale violet. *Sorosporium* has the spores formed each of a mass of several equal cells. *S. Saponariæ* distorts the anthers of the same *Caryophylleæ* as *U. violacea*; *S. hyalinum* consumes the seeds of *Astragalus glycyphyllus*, of a few other *Leguminosæ*, and of *Convolvulus sepium*; *S. primulicolum* lives on young seeds of *Primula elatior*, *P. farinosa*, and *P. vulgaris*, destroying them, but showing no sign on the exterior of the ovaries. *Urocystis* has spores like those of *Sorosporium* except in the outer cells being smaller and sterile, the inner larger and fertile; *U. Violæ* causes large swellings in the stalks and blades of the leaves, and in the stolons, of *Viola odorata*; *U. Anemones* causes similar swellings on various species of *Anemone* and other *Ranunculaceæ*; *U. sorospoides* covers the leaves of *Thalictrum minus* with dark patches of spores.

Remedies cannot be employed owing to the Fungi growing inside the tissues of the host-plants. The affected plants ought to be removed and burned, to prevent the spread of the disease.

SMYRNIUM (the old Greek name, used by Dioscorides, and derived from *smyrna*, one of the names of myrrh; alluding to the odour of the plants). Alexanders. ORD. *Umbelliferæ.* A small genus (six or seven species) of erect, glabrous, hardy, biennial herbs, natives of Europe, North Africa, and Western Asia. Flowers yellow, polygamous, in compound, many-rayed umbels. Radical and lower leaves ternato-pinnately dissected; upper ones undivided, or having fewer segments. Before the introduction of Celery, *S. Olusatrum* was cultivated as a salad plant, under the names of Black Pot-herb, Common Alexanders or Alisanders, and Horse Parsley; it somewhat resembles Celery in flavour, but is stronger and less agreeable. None of the species have any horticultural value.

SNAILS. What has been already said in regard to **Slugs** (which *see*) is equally applicable to Snails, except that the latter animals possess large and conspicuous spiral shells, into which they withdraw at the approach of cold or dry weather, and in which they protect themselves by means of opercula of firm texture with which they close the opening of the shell. Thus guarded against injury from without, they may remain motionless for long periods, even for several years. As regards the nature of the tongue and of the foot, their general habits, and also the methods of remedy, and of prevention of attacks, it is needless to repeat what is said under **Slugs.** Snails do not, however, commit such ravages as the latter creatures. It is necessary to break the shells to permit the remedies employed to reach their bodies. Hand-picking is probably the most certain cure. The injurious Snails chiefly belong to the genus *Helix*; but many of the smaller species, even in this genus, do no appreciable harm. The larger and more conspicuous kinds are: *Helix pomatia*, the "Apple Snail," whose shell reaches 2in. in breadth, and is dull yellowish-white, with spiral lines of brown. This Snail is found only in the South of England, and is said to have been introduced by the Romans, by whom it was eaten, after having been fed up for some time, to bring it into good condition for the table. *H. aspera*, the Common Snail, is usually common in gardens. The shell may reach 1½in. in diameter; it is yellowish-brown, with five dark brown lines or narrow bands running round it; the epidermis is rough, and wrinkled. *H. hortensis* also occurs in gardens, but is commoner throughout Britain (along with *H. nemoralis*, of which it is often regarded as a variety) beside hedgerows or on banks, among tangled vegetation. Both forms vary much in colour of the shells, from white or yellow to brown, with from one to five dark brown lines or narrow bands around them; or the shells may show no markings. The chief difference between the two forms is that *H. hortensis* has the out-turned lip pale, while *H. nemoralis* has it dark; each is about 1in. broad. The other species need not be separately mentioned, as they do little harm in gardens, or do not live there. Snails are preyed on by the larvæ of Glowworms and by other kinds of beetles, *e.g.*, *Drilus*, *Staphylinus*, &c. Thrushes, blackbirds, and various other birds, feed greedily on them; and one of the best methods, when practicable, for reducing their numbers is to turn a flock of ducks into the place to be cleared. For other remedies, *see* **Slugs.**

SNAKE GOURD. *See* **Trichosanthes anguina.**

SNAKE-MILLIPEDES. A name applied, by John Curtis, to a genus of **Millipedes** (which *see*) named *Julus*, because of their resemblance in form to miniature snakes. Several of the species are of very frequent occurrence; and, at times, do a good deal of harm to Strawberries and other fleshy fruits on the ground, as well as to roots of plants.

SNAKE-PLANT. A common name for *Dracunculus vulgaris.*

SNAKE-ROOT. A popular name for many plants which possess reputed curative properties for snake-bites. The following are the most important: *Actæa racemosa*, *Aristolochia Serpentaria*, *Casearia ulmifolia*, *Chiococca angustifolia*, *Liatris scariosa* and *L. squarrosa*, *Ophiorrhiza Mangora*, and *Polygala Senega.*

SNAKE'S BEARD. *See* **Ophiopogon.**

SNAKE'S HEAD. *See* **Fritillaria Meleagris** and **Iris tuberosa.**

SNAKE'S-MOUTH ORCHIS. *See* **Pogonia ophioglossoides.**

SNAKE'S TONGUE. A common name for **Ophioglossum** (which *see*).

SNAKEWEED. *See* **Polygonum Bistorta.**

SNAKE-WOOD. *See* **Cecropia** and **Strychnos colubrina.**

SNAP BEETLE. *See* **Wireworms.**

SNAPDRAGON. *See* **Antirrhinum.**

SNAPWEED. A name applied to various species of *Impatiens.*

SNOUT MOTHS. A small group of slender-bodied Moths, that take their popular name from the long palpi, or feelers, projecting like a snout from the front of the head. The form of the insect when the wings are closed is very characteristic, the wings lying almost flat, and giving an outline like the Greek letter *delta* (Δ), whence the scientific name *Deltoides* has been conferred on the group. None of the species are large, most of them scarcely exceeding 1in. in spread of wings; while only one British species (*Hypena proboscidalis*) reaches 1½in. across the wings. This species feeds on Nettles, and may therefore be regarded as useful. Very few of the insects in the group are injurious to garden produce; in fact, the only one that deserves special notice as hurtful is the Buttoned Snout (*H. rostralis*), which, in the larval state, feeds on the Hop, and is very common in the Hop-growing districts. The moth measures a little over 1in. across the fore wings, which are greyish-brown, with two dark brown cross-lines and a pale grey line near the hind margin, ending in a dark brown streak at the tip of each wing. In the middle of each fore wing is a raised tuft of scales. The hind wings are grey. The larva is slender, and pale green, with a narrow, dark green line down the back, and a broken, white line above the feet on each side; the head is brown. When the larva is touched, it jerks itself rapidly about. It forms a cocoon among dead leaves or other shelter on the soil, becomes a pupa, and comes out as a moth after about three weeks. The larvæ may be removed from Hops by beating the plants over an umbrella or sheet.

SNOW. In most cases, Snow may be regarded as beneficial in its effects on garden produce, inasmuch as it forms a very efficient protection against injury from frost. Plants under a few inches of loose snow suffer little harm from frosts that would prove fatal to hardier species without this protection. But Snow may also act hurtfully in spring by destroying seedlings. This occurs, in most cases, when a slight thaw is followed by frost, so as to cause the formation of a continuous surface-crust of ice. If this continues for some days, the young plants are much weakened, or are killed, owing to the necessary air being cut off; and, when the Snow is all melted, only the decaying remains show where they had been.

Evergreen trees are liable to serious injury from the pressure of Snow, which tears off or distorts their branches. Deciduous-leaved trees are much less liable to suffer in this way, as Snow can seldom adhere to the bare branches in quantity sufficient to cause harm. The danger is greatest during snowfalls in calm weather, with the temperature about the freezing-point, as the Snow then adheres to the branches and leaves, and collects into heavy masses. In windy weather, and at temperatures too low for the Snow to ball together, the risk is comparatively slight. The trees that suffer most from injuries due to the weight of Snow are Spruces, and others with horizontal branches, the leaves on which are so arranged as to afford a considerable surface for the Snow to lie on.

Remedies. It is scarcely possible to do anything to save seedlings from injury, beyond breaking the ice-crust as much as possible. Trees may be saved from being injured by the weight of Snow on the branches, if it is shaken off with long poles while loose. If a branch is entirely broken off, or so far as to hang down, the surface of the wound on the tree should be smoothed so far as possible, and covered with tar or any other convenient application, to prevent the entrance of moisture, or of parasites. If the injury is detected as the branch is beginning to yield, the Snow should be shaken off, and the branch supported by stays of any convenient kind.

SNOWBALL-TREE. *See* **Viburnum Opulus.**

SNOW BERRY. *See* **Chiococca** and **Symphoricarpus racemosus.**

SNOWDROP. *See* **Galanthus nivalis.**

SNOWDROP-TREE. *See* **Halesia.**

SNOWDROP-TREE, AFRICAN. *See* **Royena lucida.**

SNOWFLAKE. *See* **Leucoium.**

SNOW FLOWER. A name applied to *Chionanthus.*

SNOW GLORY. A common name for *Chionodoxa Luciliæ.*

SNOW IN SUMMER. A popular name for *Cerastium tomentosum.*

SNOW PEAR. *See* **Pyrus sinensis.**

SNOW-TREE. *See* **Pyrus nivalis.**

SNOWY FLY (*Aleyrodes proletella*). A small, four-winged Fly, that lives on the lower leaves of Cabbages, often in such numbers as to cause the leaves to show yellow or pale patches, or even to wither and die, so that the plants are much injured where the attack is severe. The Snowy Fly is nearly related to Aphides, and resembles them in general form and in size, the length not exceeding $\frac{1}{16}$in., and the spread of wings being about $\frac{1}{8}$in. It has, however, no honey-tubes, and is snowy-white in colour, owing to its being covered with a white, powdery coat. Below this coat the head and the thorax are black, marked with yellow; the abdomen is yellow or rosy-red, and the front wings are marked with a dusky spot near the middle. On the head is a beak, as in Aphides, which is inserted into the leaf, and serves for sucking in the sap. The female insects place their eggs in patches on the leaves; and the young, on emerging, scatter themselves over the leaves, which they pierce with their suckers, and to which they adhere closely. Each then becomes covered with a white scale, bearing two yellow spots; and below this it becomes a pale pupa, with red eyes. The whole metamorphosis occupies nearly four weeks.

Remedies. The most reliable is to remove and burn infested leaves. A remedy less to be trusted is throwing them into a liquid manure tank, or into a farmyard, where the trampling under foot destroys the larvæ and pupæ. Dusting the plants with soot or ashes, and syringing with tobacco-water, have also been recommended.

SOAP. As a preventive against, or as a cure for, the depredations of insects on cultivated plants, Soap is often used, either in the form of suds, or along with other remedies (*e.g.*, Carbolic Acid and Paraffin), which it helps to keep mixed with the water. Where Onions or roots, such as Carrots and Radishes, are suffering from the inroads of larvæ, great benefit is experienced

Soap—*continued.*

from watering the plants freely with soapsuds twice or thrice. It is recommended also to mix the soapsuds either with equal parts of gas-water, or with gas-tar in quantity such as to cause a strong smell, sufficient to keep the insects from laying eggs on the plants. Soap-boilers' waste, *i.e.*, the coarse, alkaline solutions that are formed as waste products in making Soap, have been found of service when used instead of the above mixture. Soapsuds are also used against caterpillars on Gooseberries and other plants, being applied by means of a syringe. When Soap is employed to cause insecticides to mix more readily with water, it is well to use Soft Soap, as being stronger, and better suited to effect the end in view. With its aid, a good many substances may be kept much more uniformly diffused in water than could otherwise be done. Carbolic Acid is prepared thus, in the proportion of one part of acid to ten of Soap, with which it is very thoroughly mixed. The mixture is then diluted to the desired strength; and the solution is sprinkled with a watering-pot on plants infested with Green Fly or larvæ, &c. Soft Soap is also used in combination with tobacco-water, sulphuret of lime, sulphur, or other substances, as a wash for the trunks of Apple-trees infested with American Blight; for walls, to destroy the Red Spider; and against such other injurious creatures as live on the bark or in crevices of the walls on which trees are trained. In all such mixtures, the substances used along with the Soap should be thoroughly mixed with it, and water should then be added till the mixture can be painted on the bark or wall; or more water may be used, and the fluid may then be rubbed well in with a stiff brush, or may be thrown from a syringe upon the places to be cleansed.

SOAP BARK TREE. *See* **Quillaja Saponaria.**

SOAP BERRY TREE. *See* **Sapindus.**

SOAP BULB. A common name for *Chlorogalum pomeridianum.*

SOAPERS' ASHES. These are occasionally used as manure for plants. They consist largely of carbonate of lime, mixed with sulphuret and sulphite of lime, and a small quantity of sand and other rubbish. While fresh, they injure plants, and ought therefore to be left exposed to the atmosphere for some time. If this is done, they absorb oxygen, and the sulphurets and sulphites become converted into the sulphate of lime, or gypsum; so that at last the effect, when they are employed as manure, is but little different from that which results from the use of the same quantity of a mixture of carbonate of lime (chalk) and sulphate of lime (gypsum). The value of Soapers' Ashes as manure is not great.

SOAP PODS. A popular name for the pods of several species of *Cæsalpinieæ.*

SOAPWORT. *See* **Saponaria officinalis.**

SOBOLES. Shoots, especially those from the ground.

SOBOLIFEROUS. Bearing vigorous, lithe shoots.

SOBRALIA (named in honour of Don F. M. Sobral, a Spanish botanist). ORD. *Orchideæ.* About thirty species have been referred to this genus; they are tall, leafy, not tuberous, free-growing, stove, terrestrial orchids, natives of the Andes of tropical America, from Peru to Mexico. Flowers large and showy, few in a terminal, axillary raceme, sometimes reduced to one flower; sepals unequal, erect, connate at base; petals similar or broader; lip erect from the base of the column, around which its lateral lobes are folded, the limb spreading, concave, undulated or fimbriate, undivided or two-lobed; column elongated, slightly incurved, semi-terete; bracts appressed. Leaves scattered, coriaceous, plicate-veined, sessile in the sheaths. The best-known species are here described. "The East Indian or Mexican house will either of them suit these plants, which thrive best in pots of large size, potted in rough, fibrous peat . . . . which should overlie about 3in. of drainage. An abundant supply of water at the roots in the growing season is essential to their well-being, but afterwards much less will suffice. The stems grow up in thick tufts; and when the plants get too large, they should be turned out of the pot, and divided into several pieces, each of which will soon grow and make a flowering plant. The genus is far too much neglected by orchid-growers" (B. S. Williams).

S. Cattleya (Cattleya-like).* *fl.* resembling those of a Cattleya; sepals and petals purplish-brown; lip purplish, with three yellow, crested keels, forming a sharp angle by its lateral lobes overlapping the column; inflorescences several, lateral. *l.* oblong, acuminate, plaited, shining. Stem stout. Columbia, 1877. A plant of great beauty.

S. chlorantha (yellow-flowered). *fl.* yellow, whole-coloured, fully 4in. long, sessile; lip obovate, the disk striated, the margins undulated, a pair of deep lamellæ extending from the base to the apex. June. *l.* very fleshy, hardly plicate, loosely striated, oblong; upper ones changed to ovate, cucullate bracts. *h.* 1ft. Brazil, 1852. (B. M. 4682; F. d. S. 840.)

S. decora (comely). "This differs from *S. sessilis,* not only in being perfectly free from the black hairiness characterising that species, but also in being a smaller plant, with a truly cuneate lip, in having whitish flowers with a rose-coloured lip, and the petals overlaying the sepals, so that the back of the former answers to the face of the latter" (Lindley). Guatemala, 1836. (B. M. 4570 and L. J. F. 104, under name of *S. sessilis.*)

S. dichotoma (dichotomous).* *fl.* white outside, violet within, sometimes whitish-rose with a rose and purple lip, or the whole deep red, fleshy; lip cucullate, three-lobed, the lateral segments entire, the middle one emarginate, crisped, crested-lacerate at apex; racemes lateral, drooping, dichotomous, flexuous, many-flowered. March. *l.* hard, plicate, acuminate, narrowed at base. Stems 6ft. to 20ft. high, resembling bamboos. Peru. A grand species.

S. fragrans (fragrant). *fl.* in pairs, 1½in. long, deliciously scented; sepals externally dirty purplish-green, keeled; petals pale yellow, thin, flat, lanceolate; lips of a brighter yellow, the middle lobe deeply fringed and furnished with nine lacerated crests. July. *l.* very smooth, rather fleshy, perfectly naked, with a short, keeled sheath. Stem two-edged, scarcely 1ft. high. New Grenada, 1854. (B. M. 4882.)

S. leucoxantha (whitish-yellow). *fl.*, sepals white, recurved, oblong-ligulate; petals white, rather shorter and broader; lip white outside, deep golden-yellow, flushed with orange in the throat and disk, passing off to white at the edge, oblong-flabellate, convolute at base, the expanded front portion bilobed and crenulate; bracts of the spathe scarious, spotted with brown. August. *l.* plicate, cuneate-oblong, long-acuminate, the sheaths warted. Stems 1ft. or more high. Costa Rica.

S. Liliastrum (Star-Lily). *fl.* white, veined with yellow, large, pendulous; racemes terminal, distichous, many-flowered, with spathaceous bracts. July and August. *l.* lanceolate, very acute, striated, sheathing at base. Stems 8ft. to 10ft. high. British Guiana, Brazil, 1840. (L. S. O. 29.) SYN. *Epidendrum Liliastrum.*

S. L. rosea (rose-coloured). *fl.*, petals and lip of a rich rose-colour, the latter veined with white.

S. macrantha (large-flowered).* *fl.* beautiful rich purple and crimson, aromatic, 6in. across; sepals oblong; petals broader, crisped in the upper part; lip folded round the column at base, very broad and bilobed at the apex, wavy at the edges, having a pale yellowish spot in the centre; racemes short. Summer. *l.* ovate, acuminate, plicate. Stems 6ft. to 8ft. high. Mexico and Guatemala, 1842. The finest species of the genus. (B. M. 4446; F. d. S. 669; P. M. B. xiv. 241.)

S. m. albida (whitish). *fl.* of a very pale rose-colour. (G. C. 1871, p. 906.)

S. m. nana (dwarf). *fl.* smaller than in the type; lip dark violet, yellow at the base. A dwarf variety.

S. m. purpurea (purple). *fl.* of a rich purple.

S. m. splendens (splendid). *fl.* darker than those of the type, but not so large. June to August. 1846. A charming variety. "WOOLLEY'S" variety is a very dwarf form of this, producing splendid flowers in June and July.

S. rosea (rose-coloured).* *fl.* very large; sepals and petals dark mauve; lip crimson, with a white centre, very open; raceme short, the rachis flexuous; bracts boat-shaped, large. *l.* ovate, acuminate. Stems stout, 4ft. to 6ft. high. Peru and New Grenada. A fine species; the spikes have four flowers, all opening at once. SYN. *S. Ruckeri* (R. X. O. i. 43; W. S. O. iii. 19).

S. Ruckeri (Rucker's). A synonym of *S. rosea.*

S. sessilis (sessile-flowered). *fl.* deep rose-colour, the lower half of the lip tinged with yellow, solitary, sessile; lip rhomboid-oblong, bilamellate at base; bracts none or only a few, leafy at apex. December. *l.* beneath (as well as the stems) covered with dark pubescence. British Guiana, 1840. (B. R. 1841, 17.)

VANDA INSIGNIS AND VAR. SCRŒDERIANA.

Sobralia—*continued.*

S. suaveolens (sweet-smelling). *fl.* yellowish-white, richly perfumed; lip white, brown on the disk of the front lobe, the keels yellow. Central America, 1878. This species is very similar in habit to *S. decora*.

S. violacea (violet). *fl.* pale violet, larger than those of *S. decora*; lip convolute, not unlike that of a Cattleya; bracts imbricated, somewhat leafy. July. *l.* hard, lanceolate, deeply plicate; sheaths slightly warted. New Grenada. Plant larger than *S. decora*. There is a variety having white flowers, with a yellow disk to the lip.

S. xantholeuca (yellowish-white). *fl.* large and handsome, deflexed; sepals and petals pale yellow, the former oblong-lanceolate, the latter broader and wavy at the edges; lip longer, deeper yellow, much frilled, emarginate. *l.* lanceolate, acuminate, plaited, the sheaths dotted with brown. Native country unknown. (Gn. xxii. 366; W. O. A. vi. 250.) – Guatemala

SOCRATEA (named after the philosopher Socrates, the greatest of the Greeks). ORD. *Palmæ*. A small genus (three to five species) of stove, unarmed palms, natives of North Brazil and Columbia. Spathes five to eight, deciduous, the upper ones complete; spadices solitary, horn-like and recurved before flowering. Fruit ellipsoid or oblong-obovoid, one or rarely two-seeded. Leaves few, terminal, equally pinnatisect; segments oblique, cuneate-flabellate, deeply laciniate, the laciniæ narrow, sinuate-toothed. Only one species calls for mention here. Its aërial roots are studded with small spines, used by the Indians as a Cassava grater. For culture, *see* **Iriartea.**

S. exorhiza (rooting outwards). Zanona Palm. *fl.*, spathes five or six, deciduous; spadix 1½ft. long, spreading when flowering, pendulous in fruit. *fr.* yellowish or yellowish-green, scarcely fleshy, ovate-elliptic, eight to twelve lines long. *l.* 12ft. to 20ft. long; pinnæ oblique, sub-trapezoid, sinuate-toothed, flat; petioles cylindrical, convolute at base. Trunk 60ft to 100ft. high. Aërial roots eight to twenty or more, emerging 6ft. from the ground. Guiana, Amazons River, 1849. SYN. *Iriartea exorhiza.*

SODA. A substance composed of the alkaline metal Sodium, combined with Oxygen, together with a certain amount of water, called Water of Hydration. Sodium is one of the most widely-diffused elements; and its numerous compounds are almost all readily soluble in water. It is very difficult to get entirely clear of the element, even in the chemical laboratory, and it is impossible to do so in soils: hence, plants are constantly supplied with it in solution from the soil, and it is found in the ashes of all plants. Experimental cultivation of plants from which it is, to the utmost, withheld, proves that it is not indispensable to any plant; though it has been asserted that Wheat, Oats, and Barley require an appreciable trace of Sodium to allow them to form perfect seeds. It has also been stated, as a result of experimental cultivation, that Sodium may, in part, functionally replace Potassium in plants; but there seems reason to believe that Sodium produces very little, if any, effect on the health of plants, though indispensable in the nourishment of animals, including man.

SODIUM CHLORIDE. *See* **Salt.**

SOFT GRASS. *See* **Holcus.**

SOIL. The comparatively soft and loose upper layer of the earth's crust, upon which plants depend for their nourishment. The various kinds of Soils, and their modes of origin, will be found described below. Soils should be carefully examined as regards their composition and physical properties, in order to ascertain their capabilities for cultivation, the kinds of plants for which they are naturally best fitted, and the means by which they can be rendered more fertile.

ANALYSIS. Soils may be examined in the following way, as regards their general composition; and much valuable information can be obtained from such an analysis: The Soil is first thoroughly dried at 212deg. Fahr., and a given weight, say ½lb., is boiled in distilled water till the particles of which it is made up fall thoroughly apart. The substances in the soil that are soluble in pure water will be dissolved in this way; and the solution is carefully filtered through paper into a vessel, and kept for chemical analysis. The solid residue is carefully washed twice or thrice with distilled water, on a filter, to remove the whole of the soluble substances, and the washings are added to the solution. The residue is then thoroughly dried at 212deg. Fahr., and weighed; and the loss, as compared with the previous weight of ½lb., gives the amount of substances in the soil that are soluble in pure water. The solid material is then again washed, and the water is poured off, carrying with it the lighter particles. This is repeated till only the sand and gravel are left behind: these are dried and separated, by sifting through gauze. The washings, also, are collected and dried. The gravel, sand, and fine particles, which form the clay or mud of soils, are weighed separately, and the relative weight of each is thus determined. Each is then examined with a good lens, and the proportions of pure quartz sand (silica), mica, volcanic rocks, limestone, or other minerals, are noted. This examination is facilitated if a little Hydrochloric Acid (Spirit of Salt) is poured over the material under examination; since quartz sand remains unchanged, limestone is dissolved with the formation of bubbles of Carbonic Acid gas, ironstone is slowly dissolved, and the acid turns brown, and gives the very characteristic test for iron by turning blue when a solution of Prussiate of Potash is mixed with it. Other minerals in Soils give less conspicuous results with the acid. The chemical analysis of the portion soluble in water, and the complete analysis of the solid residue, require a considerable knowledge of chemistry for the attainment of success, and should be entrusted to a professional analyst.

The amount of organic matter, *i.e.*, remains of animals and of plants, in Soils, very greatly affects their value. The fresh Soil must be thoroughly dried, as already stated, to drive off the water as completely as possible. A given weight of it is then burned in a platinum dish, over a lamp, in the open air; and the burning is continued till all the blackness is got rid of, *i.e.*, till the Carbon is entirely burned away. The residue is then carefully weighed again, and the loss of weight represents the amount of organic matter destroyed. It is desirable to ascertain the conditions in which the latter is present in the fresh Soil; but exact analysis demands more experience of chemical manipulation than is usually met with, except among chemists. Organic matter is usually present as Humic and Ulmic Acids (along with small quantities of some other organic acids), and insoluble vegetable matter, including often a good deal of tannin. Nitrates, also, are formed from organic remains.

Those who desire fuller details on the methods of analysis, will find them in most works on Agricultural Chemistry, such as Johnston's "Analysis of Soils," or Johnston and Cameron's "Elements of Agricultural Chemistry and Geology."

PHYSICAL PROPERTIES. Not less valuable than the knowledge of the chemical composition of Soils, is that of certain properties grouped under the term heading this paragraph. Of these, the chief are the capacity for absorbing and retaining water, various chemical compounds, and heat; the density and power of cohesion of the particles of Soil, and the mode of shrinkage in dry weather. These vary greatly, according to the composition of the Soil; but their general characters may now be indicated.

Absorption and Retention of Water. This is a quality of great importance in fitting the Soil to supply the moisture required by plants. Soils absorb rain; though when the rainfall is very heavy, they cannot absorb more than a part, and the rest flows off the surface into streams. The capacity for absorption of rain-water, and for keeping it stored within reach of the roots of plants,

Soil—*continued.*

varies much in Soils, according to their composition and the size of the particles of which they are made up. Sandy Soils rapidly absorb the water; but they allow it to drain away almost as quickly; so that plants growing in sand are liable to suffer from drought. Fine sand is about twice as retentive of water as coarse. Clay retains twice or thrice as much as sand. Vegetable earth, or humus, absorbs and retains about twice or thrice as much as clay, and becomes about two and a-half or three times as heavy when soaked in water as when dry. The more retentive Soils lose less by evaporation than do the others. Almost all Soils are more or less full of water, in the liquid form, at a few feet below the surface, the depth varying with the nature of the Soil and Subsoil and with the season of the year and the climate. This subterranean water is brought within reach of the roots of plants by what is known as *capillary attraction*, the water rising in the fine crevices between and in the particles of the Soil. If the subterranean water is stagnant near the surface, substances are apt to be formed in the Soil that are injurious to plants, and that thus diminish its fertility. Drainage is usually necessary in clays and peat Soils, to prevent water from accumulating and doing harm in this way.

Certain Soils also have the property of absorbing a good deal of vapour from the atmosphere, and condensing it in their particles, the amount increasing in proportion to the moistness of the air. Experiments have shown that humus can absorb about half its own weight of water from air saturated with vapour; and clays absorb one-tenth to one-fifth of their own weight; but quartz sand absorbs little, if any, moisture in that way. This source of moisture becomes less productive as the temperature rises. During the night, and in cold weather, it is probable that Soils absorb a good deal of moisture from the atmosphere; but when the air is warmer and drier than the soil, the latter loses water by evaporation, and what is lost in this way is replaced from below by capillary attraction. Evaporation cools the surface from which it is going on; hence, wet land is colder than that which is well-drained. Humus gives up least by evaporation, and quartz sand most, of all Soils under similar conditions.

The Power of Absorbing and Retaining Chemical Compounds is one possessed to a greater or less extent by all Soils, and is of the utmost importance in the nutrition of plants. If solutions of various kinds (*e.g.*, of Potassic Nitrate or Ammonium Nitrate, or of Phosphates of Potassium, Calcium, &c.) are allowed to trickle through a moderately thick layer of Soil, it is found that the water flowing off contains little of these substances for a time; but at last the Soil becomes saturated with them, and allows the solution to pass through unchanged. By this property of retaining certain compounds, Soils are enabled to store up soluble manures, as well as Ammonia and Nitrates from the atmosphere, and various substances formed in the changes due to weathering of the rocks and Soils; and from this store plants can draw, as they need these substances in their food. Owing to this process, filtering impure water through, or over, a sufficient extent of earth is a very efficient mode of removing impurities, and is frequently resorted to for purifying sewage-water before discharging it into streams.

The Capacity for Absorbing and Retaining Heat varies with colour and texture, with the amount of moisture in, and of evaporation from, the Soil, and with the angle of exposure to the rays of the sun, direct or reflected. Of course, the actual temperature depends also upon the amount of protection afforded by buildings or other objects in the neighbourhood.

Bottom-heat is of great use in stimulating the action of roots, but in Great Britain it can be given only in hotbeds or hothouses. Exposure to the sun's rays is, therefore, the only source of warmth that need be discussed here. The more directly the rays fall, the greater is their effect. Evaporation keeps down the temperature, and it has been found that wet Soils are usually from 10deg. to 15deg. Fahr. colder than dry ones of the same composition. Hence, draining wet Soils renders them warmer, and hastens the ripening of the crops on them. Dark grey Soils absorb most heat; next come black Soils, then brown and dark red. Pale sands, marls, and clays absorb least. The temperature of the Soil exercises a marked influence on the growth of plants, since they suffer if the buds and leaves are stimulated by a warm atmosphere while the soil is too cold to permit of the roots supplying the necessary sap to the other organs.

The Density and Power of Cohesion of the particles of Soils, and the *Mode of Shrinkage*, are of interest and importance chiefly on account of their influence on the capacities of Soils for moisture, chemical substances, and heat. Pure sands show little cohesion, and change little in bulk or form during dry weather. Clays are very coherent, and may lose as much as one-fifth of their bulk by shrinkage during droughts; and peaty Soils shrink even more than clays. Cracks form in these Soils to a considerable depth, and allow evaporation to continue; and roots are broken across, and exposed to the air in the cracks, or are crushed by the shrinkage.

Soils can frequently be much improved by a judicious mixture with others: *e.g.*, sand should be added to clay; clay or peat to sand; lime, clay, and sand to peat.

ORIGIN. All Soils are formed in one or other of two ways, either from the weathering and breaking down of rocks, or from the decay of plants or animals, and most of them are produced more or less in both ways; though the former has been the source of by far the greater bulk of all Soils except peat. In some localities, it is not difficult to recognise that the Soils are of the same composition as the rocks on which they lie, and that they are formed by the action of the weather in breaking up the rocks and reducing them to fragments. In course of time, also, the decay of successive generations of plants gives origin to an admixture of humus in almost all Soils. But, in most parts of Great Britain, the Soils are different in composition from the rocks on which they lie, and must have been brought into their present situations from a greater or less distance. That this should be the case in valleys, is easily understood, for the Soil on the slopes is constantly being carried down by showers and streams, and spread over the lower ground. This also occurs on fields or meadows along rivers in the lowlands liable to be overflowed, as the finer particles of mud in the water are deposited on the flooded ground, where free from the action of currents. Frost splits pieces of stone from exposed rocks and cliffs, and causes them to roll down the slopes, and it is also a powerful agent in reducing rocks and stones into the finer particles of which Soils are composed. But a layer of a few inches of earth will protect the rocks very greatly, if not entirely, from the action of the air, rain, and frost; and these agents are not sufficient to account for the amount and depth of soil, or for the relations of the soil to the subjacent rocks, now prevalent over the country, especially in Scotland and in the northern half of England. A far more powerful force than any now existing in Britain was, however, at work during a comparatively recent geological period. This was *ice*, which, for a long time, covered the land (much as Greenland is covered now) with a continuous sheet. Formed and renewed on the higher tracts of country, it spread down the valleys, and over all but the highest peaks, extended over the lowlands of Scotland and Northern England, and met ice

Soil—*continued.*

pushing its way down from the Norwegian mountains into the ocean. Probably, the present German Ocean was then blocked with ice; and ice from Scotland extended over the Isle of Man, the North of Ireland, and the Hebrides, and a considerable distance into the Atlantic Ocean. As the ice pressed down from the hills, its enormous weight ground down the looser and more prominent rocks, and pushed the Soil, loose rocks, and stones, before it in the direction in which it travelled, until they were deposited in hollows, protected behind hills or ridges. As the climate became warmer, the ice diminished, till it did not reach the sea; then it gradually receded in the lowlands, till it became restricted to the mountain valleys; and, finally, it disappeared completely, even from our mountains, leaving its traces only in markings on rocks over which it had passed, and in the mounds of stones and earth (moraines) left behind as the glaciers receded. The Soils formed before the Ice Age were pushed by the ice from the situations in which they had originated, over rocks of a different kind, and were so mixed together as to frequently render it very difficult to trace their sources; but, by this mixing, the Soils have often been much improved—clays, sands, and limestones being mingled, so as to combine their valuable properties.

Vegetable Earths, or *Humus*, are formed in great part of the remains of plants, and, to a slight extent, of animals; and along with these is a varying amount of Soils of purely mineral origin (as described above). Cultivated Soil usually contains a good deal of Humus, which gives a darker hue the greater the amount of it in the Soil. When the organisms decay in comparatively dry earth, the resulting Soil is known as Mould; and any Soil containing more than 6 per cent. of organic remains, is called a Vegetable Mould; but the proportion of organic matter is often much higher. These Moulds are known as sandy, clayey, or loamy, according to the nature of the mineral Soil mixed with them.

Peat is the name given to Vegetable Earths formed in the temperate zones, under water, or in swamps saturated with water. It is frequently from 5ft. to 6ft. deep, and in some Irish Peat-bogs it even reaches 40ft. in depth. It is formed by the decay of aquatic and marsh plants. Peat-bogs seem frequently to have originated in forests, where fallen trees obstructed the drainage of the surface-water. The ground became saturated with water, but the surface of the swamps then, as now, bore a luxuriant vegetation of marsh-plants and Bog-mosses (*Sphagna*), which decayed below, and formed new Peat, while they continued to grow upwards. The Peat-mosses, so plentiful in many districts, have been formed chiefly, if not almost wholly, since the Ice Age; they seem to be now wasting away from natural causes, apart from human agency, more rapidly than they are renewed. Newly-formed Peat yields in general only 1 or 2 per cent. of mineral substances derived from the plants, and is brown, light, porous, and fibrous. Deeper down, the Peat becomes much darker and denser, and gradually loses all traces of its vegetable origin: the ash may reach as much as from 10 to 30 per cent. of its weight. Peat-bogs are not adapted for cultivation in their natural condition, although they are the favourite habitat of certain plants, such as many of the Heaths, Rhododendrons, and allied plants, and although Peat is a most useful material in gardening operations, being employed in the Soils prepared for the cultivation of many plants from the Cape of Good Hope and Australia, and many Monocotyledons. Peat is also an excellent material for steeping in liquid farmyard manure, either in tanks, or as litter, to prevent the manure running to waste, the Peat being afterwards used as manure, alone or in composts.

To render Peat-bogs fertile, the excess of water must be drained off, and lime, sand, and clay added. The effect of this treatment is that the Soil is warmed, and the hurtful organic acids are destroyed by the lime; while the lime, sand, and clay, together, render the Soil more open and pervious to gases, and prevent stagnation of water in it. By such treatment, Peat-bogs may, in time, be converted into fields or gardens, capable of yielding a good return; but the labour and expense incurred in improvements of this kind are usually considerable.

CLASSIFICATION. The chief kinds of Soils have been incidentally mentioned above, but it will be well to recount their more important differences. They may be classed according to their composition as follows:

Sandy Soils, with not less than 80 per cent. of pure quartz sand; such as may be met with among the dunes or sandhills, along our coasts. These contain little nourishment for plants, are very liable to suffer from drought, have little cohesion, and are blown about by the winds; they produce light, but early, crops. Sandy Soils can be improved by the addition of clay, and lime in the form of marl or of chalk. Turnips often do well in the better class of Sandy Soils; and, in wet years, these Soils yield a very fair produce.

Clay Soils, chiefly composed of clay (Aluminum Silicate), result from the breaking down of felspars in granites and in rocks of similar composition. They are heavy, dense, and very coherent, and are very retentive of water; but the water is apt to stagnate in them, and to render them late and cold by the amount of evaporation from the surface, near which it remains, there being no crevices for it to pass down. In droughts, plants on Clay Soils are apt to suffer, as roots cannot penetrate into stiff clays, or obtain water from the Subsoil. These Soils contain abundance of mineral food for plants; but it is rendered unavailable by their stiff texture. When this is corrected, by the addition of sand, lime, ashes, or suitable manures, and when the stagnant water is removed, by drainage, clays become very fertile.

Calcareous Soils contain above 20 per cent. of Carbonate of Lime, in the form of *chalk*, or mixed with clay to form *marls*. These may be dry and friable, or (*e.g.*, marl) may approach the clays in texture. In productiveness they vary greatly. They are less frequent than the two soils already described.

Peaty Soils have been discussed above at sufficient length; as have been also the methods of improving them.

Vegetable Moulds (*Humus*) vary much in percentages of organic matter contained in them. They belong to the more fertile kinds of Soils, and are retentive of water.

Gravelly Soils may belong to any one of the first three classes, seldom to the fourth. The term applies only to the presence of gravel or stones in Soils, without reference to their composition.

Loamy Soils are intimate mixtures of all the first four, in which the clay is under 50 per cent., and the lime under 5 per cent. Loams are productive and excellent Soils, being easily cultivated and fertile.

SOJA. Included under **Glycine** (which *see*).

SOLANACEÆ. A rather large natural order of herbs, erect or climbing shrubs, or rarely trees, mostly inhabiting the warmer regions of the globe. Flowers hermaphrodite, regular or slightly irregular; calyx five (rarely four, six, or seven) parted, toothed, or lobed, gamosepalous; corolla gamopetalous, tubular, funnel, salver, or bell-shaped, or rotate; limb five (rarely four, six, or seven) parted or lobed, the lobes equal or obscurely bilabiate; stamens alternating with the corolla segments, affixed to the tube; inflorescence usually cymose. Fruit capsular or baccate. Leaves alternate, the upper ones usually twin, in one instance whorled, entire, toothed, lobed or dissected. Of all the plants comprised in this order, the most useful to man is the

Solanaceæ—*continued.*

Potato (*Solanum tuberosum*). Tobacco, the manufactured leaves of several species of *Nicotiana*, principally *N. Tabacum*, is also a highly-important article of commerce. Among other products may be mentioned: Chilies, the berries of *Capsicum annuum*; Cayenne Pepper, the ground fruits of a sub-woody species of *Capsicum*; the Tomato or Love Apple (*Lycopersicum esculentum*), widely cultivated; and the Brinjal, Aubergine, or Egg Plant (*Solanum Melongena*). The principal medicinal properties of *Solanaceæ* are: Belladonna, Henbane, and Stramonium. The fruits of *Solanum quitense*, and other species, are edible. About sixty-six genera and 1200 species are included under *Solanaceæ*. Examples: *Cestrum*, *Lycopersicum*, *Nicotiana*, *Petunia*, *Physalis*, and *Solanum*.

SOLANDRA (named in honour of Daniel Charles Solander, LL.D., F.R.S., 1736-1782, a Swede, disciple of Linnæus, and fellow-traveller with Sir Joseph Banks and Captain Cook). ORD. *Solanaceæ*. A small genus (about four species) of tall-climbing, stove shrubs, natives of tropical America. Flowers large; calyx long-tubular, two to five-cleft at apex; corolla funnel-shaped, with an ample, campanulate throat, and a limb of four broad lobes; stamens five, declinate above the middle; pedicels solitary, thick. Berries globose, pulpy. Leaves entire, coriaceous, shining. The species are very handsome subjects when in flower. If allowed abundance of space and moisture, they grow rapidly, but produce no blossoms. In order to avoid this, insert the plants in loamy soil, and encourage them to grow rapidly at first by giving plenty of water; then withhold water altogether until the leaves begin to drop off from drought, and an abundance of flowers will be the result. Propagation may be readily effected by cuttings, inserted in mould or tan. If small flowering plants are desired, the cuttings should be taken from flowering shoots.

S. grandiflora (large-flowered).* Peach-coloured Trumpet Flower. *fl.*, calyx 2in. to $3\frac{1}{2}$in. long, three or four-cleft; corolla greenish-white, 7in. to 10in. long, the lobes undulate-crenate. March and April. *fr.* greenish, ovoid-globose, of a sweet, sub-acid flavour. *l.* elliptic or elliptic-oblong, $2\frac{1}{2}$in. to 5in. long. *h.* 15ft. Jamaica, 1781. (B. M. 1874.)

S. guttata (spotted). *fl.* erect, terminal; corolla pale yellow, marked with purple spots in the throat, large, funnel-shaped, the lobes crispately crenated, spreading. March. *l.* broadly elliptic-oblong, 3in. to 6in. long, acute, downy beneath. *h.* 10ft. Mexico, 1830. (B. R. 1551.)

S. lævis (smooth). *fl.* fragrant; calyx 4in. long, tubular, two-lipped at the extremity; corolla greenish-cream-colour, white at the limb, nearly 1ft. long, slender below, bell-shaped above, the limb spreading, of five singularly crisped and waved lobes; peduncles thick, $\frac{1}{2}$in. long. November. *l.* alternate, oblong-oval or somewhat obovate, acute, paler beneath, small in proportion. Branches spreading, 2ft. long. South America, 1846. (B. M. 4345.)

S. longiflora (long-flowered). *fl.*, calyx about 3in. long; corolla white, with a purplish tinge, 1ft. long, the lobes undulately toothed. November. *fr.* $1\frac{1}{2}$in. in diameter. *l.* elliptic-, lanceolate-, or obovate-oblong, $2\frac{1}{2}$in. to 4in. long. *h.* 6ft. Jamaica, 1846.

S. viridiflora (green-flowered).* *fl.* green, terminal, solitary, pedunculate; calyx segments five, acute; corolla drooping, the segments elongated and revolute. May to July. *l.* elliptic-oblong, attenuated at both ends, acuminate, glabrous. *h.* 2ft. to 3ft. Brazil, 1815. Deciduous. (B. M. 1948.) *Dissochroma viridiflora* is now the correct name of this plant.

SOLANUM (the old Latin name, used by Pliny). Nightshade. Including *Aquartia* and *Nycterium*. ORD. *Solanaceæ*. An immense genus (upwards of 900 species have been described, but not more than 700 are distinct as such) of spiny or unarmed, stove, greenhouse, or hardy shrubs, herbs, or small trees, of very variable habit; they are mostly confined to the hotter parts of the globe, and are especially abundant in America. Flowers yellow, white, violet, or purplish; calyx campanulate or spreading, five or ten-toothed, lobed, or parted, rarely four-parted; corolla tube very shortly rotate or rarely broadly campanulate, the limb five (rarely four or six) lobed, plaited in bud; stamens five, rarely four or six, affixed to the throat; filaments very short; cymes dichotomous or racemose, lateral or terminal. Berry globose or elongated. Leaves alternate or sub-opposite in equal pairs, entire, lobed, or pinnatisect. The most important species in the genus is *S. tuberosum*, which has been exhaustively treated in this work under its common name, **Potato.** For the most recent conclusions respecting this species and the origin of the Potato, see the papers published in vol. xxvi. of the "Gardeners' Chronicle." *S. Melongena* furnishes the fruit known as **Aubergine** (which *see*), and the berries of several other species are edible. *S. Dulcamara* (Bittersweet) and *S. nigrum* are British plants. Solanums succeed in almost any rich, loamy soil. The annuals, and a large proportion of the other species, may be readily raised from seeds. Those which bear tubers may be increased thereby; and the stove and greenhouse shrubby plants may generally be propagated from cuttings, inserted, when young, in a warm propagating frame. For sub-tropical gardening, *S. marginatum*, *S. robustum*, and *S. Warscewiczii* are invaluable; *S. Capsicastrum* and *S. Pseudo-capsicum* are popular plants for greenhouse decoration when covered with their bright-coloured berries. Out of twenty tuber-bearing species which have been named, J. G. Baker (in the "Journal of the Linnean Society," vol. xx.) is of opinion that "six, *viz.*: *S. tuberosum*, *S. Maglia*, *S. Commersoni*, *S. cardiophyllum*, *S. Jamesii*, and *S. oxycarpum*, possess a fair claim to be considered as distinct species in a broad sense." A large number of the species have been introduced to cultivation, and many of them are highly deserving of a place in the garden, on account of their ornamental appearance. Except where otherwise indicated, those described below are shrubs. All flower in summer.

S. acanthodes (spiny).* *fl.*, calyx hemispherical, bristly; corolla pale blue-purple, nearly flat, lobed to about the middle, $2\frac{1}{2}$in. in diameter, the margins waved; cymes lateral, scorpioid, six to ten-flowered. *l.* 1ft. or more long, ovate or obovate-oblong, pinnatifidly lobed to the middle or lower, deeply two-lobed at base; lobes horizontal, sinuate, sub-acute; midrib and horizontal nerves orange-red, and, as well as the petioles, prickly. Stem and branches dark green and bright orange, prickly. *h.* 3ft. to 6ft. Brazil, 1863. Stove. (B. M. 6283.)

S. æthiopicum (African). *fl.*, calyx leafy, five to seven-cleft; corolla white, deeply five to seven-cleft, the segments triangular-oblong; racemes few-flowered, drooping. *fr.* red, large, globose, edible. *l.* ovate-lanceolate, repand-angled, solitary or twin, petiolate, 5in. long, very unequal at base, acuminate, paler beneath. Stem 1ft. to 2ft. high. Africa, 1597. Hardy annual.

S. amazonium (Amazon). *fl.*, calyx five-cleft; corolla blue, with five yellow rays on the outside, five-cleft, 2in. in diameter; pedicels one-flowered; peduncles 1in. long; racemes cymose, terminal or lateral, nearly 2in. long. *l.* solitary, above twin, rarely ternate, petiolate, spreading, 4in. to 5in. long; lower ones larger, sometimes 6in. long, sparsely prickly on the nerves and petioles. Stem unarmed. *h.* 3ft. to 4ft. Mexico, 1800. Stove. (B. R. 71; L. B. C. 352.) SYN. *Nycterium amazonicum* (B. M. 1801).

S. Anguivi (Anguivi). A synonym of *S. indicum*.

S. anthropophagorum (man-eating). Cannibal's Tomato. *fl.* small; calyx five-lobed; corolla white, rotate, pubescent; pedicels few, drooping. *fr.* red, resembling tomatoes, obscurely two-lobed, nippled at apex. *l.* glabrous, ovate, acuminate, entire or (the lower ones) angularly lobed, long-petiolate. *h.* 6ft. Fiji. Stove. The berries of this species were formerly eaten by the natives with human flesh. (B. M. 5424.)

S. asarifolium (Asarum-leaved). *fl.*, calyx truncately five-toothed; corolla whitish, rotate, five-lobed; peduncles sub-axillary, solitary, one-flowered. *l.* twin, very unequal, membranous, glabrous; one petiolate, ovate-cordate, rounded at apex, entire, slightly ciliated; the other sessile, minute, orbicular. Stem creeping, branched. Venezuela, 1870. Stove perennial. (Ref. B. 255.)

S. atropurpureum (dark purple).* *fl.*, calyx tinged with purple, deeply five-cleft; corolla diluted with yellow, somewhat five-parted, the segments acuminate, four lines long; racemes lateral, six to eight-flowered, nearly 1in. long. *fr.* white, at length yellow. *l.* 6in. to 7in. long, long-petiolate, unequally sub-cordate, five to seven-parted, armed with robust prickles nearly 1in. long. Stem erect, branched, dark blood-colour; prickles unequal, dark purple at base. *h.* several feet. Brazil, 1870. Greenhouse sub-shrub. (Ref. B. 207.)

S. aviculare. Bird Solanum; Kangaroo Apple. *fl.* few, in short, loose, pedunculate racemes; calyx lobes short; corolla violet, $\frac{3}{4}$in.

Solanum—*continued.*

to 1in. in diameter, very shortly and broadly lobed. *fr.* green or yellow, rather large. *l.* lanceolate, acute or rarely almost obtuse, mostly entire on old specimens, often pinnatifid, the larger ones 6in. to 10in. long. *h.* 5ft. to 6ft. Australia and New Zealand, 1772. An erect, greenhouse shrub or sub-shrub. (B. M. 349, under name of *S. laciniatum.*)

S. Balbisii (Balbis'). A synonym of *S. sisymbriifolium.*

S. betaceum (Beet-leaved). A synonym of *Cyphomandra betacea.*

S. campanulatum (bell-shaped). *fl.*, calyx four to five lines long; corolla violet or blue, broadly campanulate or almost rotate, 1in. in diameter, very shortly lobed; racemes loose, lateral. *fr.* ¾in. to 1in. in diameter. *l.* petiolate, ovate, sinuate-lobed, with short, broad lobes, or rarely more deeply pinnatifid, 2in. to 4in. long. *h.* 2ft. to 3ft. Australia, 1836. A prickly, greenhouse herb or under-shrub. (B. M. 3672.)

S. Capsicastrum (Star Capsicum).* *fl.* similar to those of *S. Pseudo-capsicum*, disposed in short racemes nearly opposite the leaves. *fr.* scarlet, about the size of a hazel nut. *l.* twin, one being much smaller, all penninerved, entire or slightly repand; the larger one oblong-lanceolate, 1½in. to 2in. long; the smaller one lanceolate or obovate. Stem branched. *h.* 1ft. to 2ft. Brazil. Greenhouse sub-shrub, very ornamental when in fruit. (F. d. S. 1242.) There is a variegated form of this species.

S. cardiophyllum (heart-leaved). *fl.*, calyx cyathiform, five-toothed; corolla cream-coloured, five-parted, the segments triangular, flat, acuminate, at length revolute; cymes few-flowered, terminal. *l.* auriculate, pinnate; leaflets two or three pairs, not interrupted, somewhat round-cordate, slightly fleshy. *h.* 3ft. Mexico, 1846. Hardy, tuberous perennial; at present not in cultivation in Britain. (J. H. S. iii. 71.)

S. ciliatum (ciliated). *fl.* nodding; calyx deeply five-cleft; corolla white, five-parted, nine to eleven lines across; racemes short and few-flowered; peduncles solitary or twin. *fr.* pure scarlet, globular, nearly as large as a Tangierine orange. *l.* petiolate, ovate-oblong, sinuate-lobed; lobes usually five, sometimes three or seven, ovate, acute, entire or repand, prickly. Stem 1ft. to 1½ft. high, straight, branched, very prickly. Porto Rico, 1871. Greenhouse annual. (F. M. 521; F. d. S. 1988.)

S. Commersoni (Commerson's). *fl.* in loose, compound cymes; calyx teeth as long as the tube; corolla pale lilac or white, ½in. to ⅔in. long. *l.* sometimes, but not always, pseudo-stipitate, 5in. to 6in. long; leaflets five to nine, oblong, acute or often obtuse, the terminal one much the longest, the lowest pair much dwarfed; petioles 1in. to 1½in. long. Rootstock bearing copious large tubers. *h.* 2ft. Brazil, 1822. Hardy perennial. (R. G. 1885, p. 368, and R. H. 1883, pp. 498, 499, under name of *S. Ohrondii.*)

S. corniculatum (horned). A garden synonym of *S. cornigerum.*

S. cornigerum (horn-bearing). *fl.* erect; calyx small; corolla violet, star-shaped, three or four times longer than the calyx; racemes terminal, loose, few-flowered. *fr.* yellow, pendent, ovate-conical, bearing five blunt, conical, horn-like appendages. *l.*, cauline ones 1½in. long, trisected, the segments marcescent, caducous; those of the branches sessile, cordate, ovate-oblong, acuminate, nearly triangular. Brazil, 1868. Stove climber. (R. H. 1868, 33.) SYN. *S. corniculatum* (of gardens).

S. crinitum (hairy). *fl.*, calyx five-parted; corolla white, 1¾in. to 2in. in diameter; racemes lateral, cymose, nearly simple, 4in. long. *fr.* silky-villous, seven lines long. *l.* petiolate, broadly ovate, 1ft. to 2ft. long, unequally cordate, undulated, sinuate-lobed, hairy, purple-veined; lobes short, slightly acute, tomentose-woolly on both sides, yellowish-green and unarmed above, whiter and prickly beneath. Stem and branches armed with many prickles. *h.* 4ft. to 5ft. Cayenne. Greenhouse.

S. crispum (curled).* Potato-tree. *fl.* fragrant; calyx five-toothed; corolla bluish-purple, five-cleft, eight to ten lines in diameter; corymbs 3in. to 3½in. long, terminal, at length lateral. *fr.* yellowish-white, as large as peas. *l.* simple, undivided, entire or slightly repand, petiolate, ovate, ovate-lanceolate, or sub-cordate, 3in. to 4in. long, often cuspidate at apex, loosely crisped on the margins. Stem sub-shrubby, broadly diffuse; branches herbaceous. Chili, 1824. A very showy, hardy plant, growing 12ft. to 14ft. high against a wall. (B. M. 3795; B. R. 1516; L. B. C. 1959; P. M. B. iii. 1.)

S. c. ligustrinum (Privet-leaved). *fl.* in glabrous, few-flowered corymbs. *l.* sub-cordate, 1½in. long, highly glabrous. Branches terete, glabrous, green. Chili, 1831. (L. B. C. 1963, under name of *S. ligustrinum.*)

S. cyananthum (blue-flowered). *fl.*, calyx much spreading, five-parted; corolla blue, 2in. to 2½in. in diameter; peduncles 2in. long, whitish, prickly, hairy; racemes nearly 4in. long, about five-flowered. *l.* petiolate, cordate, ovate-elliptic, undulated, 14in. long, almost unarmed, sinuate-repand or sinuate-lobed; petioles 2½in. to 3in. long, sub-terete, villous. Branches stellate, villous, whitish, prickly, and hairy. *h.* 6ft. Brazil, 1880. Greenhouse.

S. Dulcamara. Bittersweet; Dulcamara; Felon-wood; Woody Nightshade. *fl.* many, drooping; calyx lobes obtuse; corolla purple or white, ½in. in diameter, the lobes revolute; cymes panicled, leaf-opposed or lateral. *fr.* red, rarely yellow-green, ½in. in diameter. *l.* ovate or cordate, sometimes three to five-parted, 1in. to 3in. long, acuminate. Stem 4ft. to 6ft. long, trailing. Europe (Britain), &c. Perennial. (B. M. Pl. 190; F. D. 607; Sy. En. B. 930.)

S. D. marinum (sea-loving). *l.* fleshy. Stem prostrate, branched. South Coast.

S. esculentum (edible). A synonym of *S. Melongena.*

S. etuberosum (non-tuberous). A form of *S. tuberosum.*

S. Fontanesianum (Fontaines'). *fl.*, calyx urceolate, five-cleft; corolla yellow, scarcely regular, nine to ten lines in diameter, semi-five-cleft, the segments cuspidate, woolly-villous outside; racemes three or four-flowered, nearly 2in. long. *l.* petiolate, sub-pinnatipartite, 6in. long; lobes unequally sinuate, ½in. to 2½in. long, hairy and prickly on both sides; prickles yellow, 2in. to 5in. long. Stem rigid. *h.* 4ft. Mexico, 1813. Hardy annual, armed with recurved prickles. (B. R. 177.)

S. fragrans (fragrant). A synonym of *Cyphomandra betacea.*

S. giganteum (gigantic).* *fl.*, corolla blue, ⅜in. in diameter, the tube nearly as long as the lobes; cymes terminal, densely many-flowered, stellately white-woolly. *l.* oblong, cuneate at both ends, 8in. long, undulated. Stem thick, soft, prickly, stellately white-woolly. *h.* 10ft. to 25ft. India, 1792. Plant sub-arboreous. Greenhouse. (B. M. 1921.)

S. glaucophyllum (glaucous-leaved). A garden synonym of *S. glaucum.*

S. glaucum (glaucous). *fl.*, calyx cyathiform, five-cleft; corolla blue, star-shaped, ten to eleven lines in diameter; corymbs terminal, at length lateral, 3in. long, sub-trichotomous. *l.* very shortly petiolate, lanceolate-oblong, acuminate, 5in. to 6in. long, glaucous, white-margined; petioles whitish, wing-margined. Stem erect, simple, smooth, glaucous. *h.* 6ft. Buenos Ayres, 1880. Stove perennial. (B. H. iii. p. 165.) SYN. *S. glaucophyllum* (of gardens).

S. Hookerianum (Hooker's). *fl.*, calyx of four deep segments, the lower evidently formed of two, cohering at the margin; corolla blue, eight to sixteen lines in diameter, five-cleft, the lobes shorter than the tube; cymes corymbiform, one or few-flowered. *fr.* dark blue. *l.* lanceolate or elliptic-oblong, rather blunt, 1½in. to 4in. long, tapering into the short petioles, entire. Stem unarmed. *h.* 4ft. to 7ft. Mexico, 1793. A very variable, stove shrub. (B. M. 2708, under name of *S. coriaceum.*)

S. hybridum (hybrid). *fl.*, corolla pale blue, five-cleft, seven to eight lines across; cymes or umbels sessile or shortly pedunculate. All the year. *l.* persistent, ovate-cordate, sinuate-repand, 3½in. to 4in. long, including the petioles, stellate-tomentose, almost unarmed. Stems suffruticose. *h.* 2ft. Mexico, &c. Stove.

S. indicum (Indian). *fl.*, calyx lobes ⅛in. long; corolla blue, ¾in. to 1in. in diameter, the lobes broadly triangular, tomentose outside; racemes lateral, many-flowered; peduncles short, extra-axillary. *fr.* yellow. *l.* ovate, sinuate or lobed, 3in. to 6in. long, stellately woolly beneath, prickly on the nerves; petioles 1in. long. *h.* 1ft. to 6ft. India, China, and Malaya, 1732. A very prickly, much-branched, stove under-shrub. SYN. *S. Anguivi* (H. E. F. 199).

S. Jamesii (James'). *fl.*, corolla white, the segments lanceolate-deltoid, equalling the tube; cymes few-flowered. *fr.* globose. *l.* distinctly petiolate; leaflets nine to eleven, oblong-lanceolate, acuminate. Stem short, slender. Tubers minute. *h.* 9in. South-western United States and Mexico, 1884. Hardy perennial. (B. M. 6766.)

S. jasminoides (Jasmine-like).* *fl.*, calyx short, five-toothed; corolla bluish-white, nine to ten lines in diameter, deeply five-cleft, spreading; racemes 1in. to 1¼in. long, about ten-flowered. *l.* petiolate, mostly sub-cordate, ovate-acuminate, entire or sub-repand, rounded at base, 1¾in. long, sometimes two to five-cleft or parted, and 2in. to 2½in. long. Stems many, 3ft. to 4ft. long, twiggy, sarmentose, leafy. South America, 1838. Greenhouse, deciduous twiner. (B. R. xxxiii. 33; P. M. B. viii. 5.) The variety *foliis variegatis* has leaves blotched with creamy-white.

S. laciniatum (torn). A synonym of *S. aviculare.*

S. lanceolatum (lanceolate-leaved). *fl.*, calyx five-cleft; corolla blue, 1in. in diameter, semi-five-cleft, the segments ovate-triangular; cymes, or cymose corymbs, 1in. to 4in. long, unarmed. *fr.* orange-coloured, erect, globose. *l.* lanceolate or oblong-lanceolate, 6in. to 9in. long, acuminate, acute, unequal at base, obscurely greenish-canescent above; petioles five to ten lines long. Stem 6ft. or more high, with a few short, straight prickles. Mexico, 1800. Stove. (B. M. 2173.)

S. lycioides Iodasterum (Lycium-like). *fl.*, calyx five-parted; corolla angular, violet, yellow within, with a five-rayed, dark purple star; peduncles filiform, bearing one flower, axillary. *l.* elliptic, obovate-elliptic, or ovate-lanceolate, entire, cuneate at base, shortly decurrent into the petioles, paler beneath, ½in. to 1½in. long. Branches numerous, spiny. *h.* 4ft. Peru, 1791. Stove. (B. R. xxxii. 25, under name of *S. lycioides.*)

S. macrantherum (large-anthered). *fl.* sub-corymbose, long-pedicellate; calyx sinuately five lobed; corolla violet, with a five-parted limb 1in. to 1¼in. in diameter; anthers brown, thick, ¼in. long; panicle solitary, 5in. to 9in. long. *fr.* red, globose, 1in. in diameter. *l.* long-petiolate, ovate, acuminate, rounded or sub-cordate at base, entire or sub-repand, hairy-pubescent, 3in. to 5in. long. Stems climbing, woody. Mexico, 1838. Greenhouse. (B. R. xxvii. 7.)

Solanum—*continued.*

S. macranthum (large-flowered). A synonym of *S. maroniense.*

S. Maglia (Maglia). *fl.*, corolla white, the segments short, deltoid; style elongated. *l.* distinctly petiolate; leaflets few-jugate, ovate, acute. Tubers large. *h.* 1ft. to 1½ft. Chili and Peru, 1862. Hardy perennial. This is, in all probability, merely a geographical form of *S. tuberosum.* (B. M. 6756.)

S. marginatum (margined).* *fl.*, calyx five or six-cleft, prickly or unarmed; corolla white, with a small, purple centre, five or six-cleft, outside, as well as the peduncles and pedicels, snowy-tomentose. *fr.* yellow, pendulous, globose, 1in. or more in diameter. *l.* sub-cordate, sinuate-lobed, prickly on both sides, snowy-tomentose beneath, whitish-margined above. Stem erect, 3ft. to 4ft. high, snowy-tomentose, prickly. Abyssinia, 1775. Greenhouse. (B. M. 1928.)

S. maroniense (Maroni River).* *fl.*, calyx ½in. to ¾in. in diameter, unarmed or prickly; corolla bluish-violet, five or six-cleft, 1½in. to 2½in. in diameter, the segments acute; racemes cymose, 1in. to 5in. long, seven to twelve-flowered. *l.* solitary, sub-sessile, attenuated into winged petioles 10in. to 15in. long, cuneate, ovate, lanceolate, or lanceolate-elliptic, sinuate-angled or sinuate-lobed; lobes nine or ten, entire or sub-repand, prominently prickly on the veins. Stem prickly, branched at apex. *h.* 6ft. to 14ft. Brazil. Stove. See Fig. 498. (B. M. 4138, under name of *S. macranthum.*)

Solanum—*continued.*

S. Melongena (Melongena).* Bringall or Brinjal; Egg Plant; Jew's Apple; Mad Apple. *fl.*, calyx lobes ¼in. to ½in. long; corolla blue, 1in. to 1¼in. in diameter, shortly lobed, hairy on the plaits without; cymes lateral, few-flowered. *fr.* white, yellow, or dark purple, ellipsoid or elongated, 1in. to 9in. in diameter, edible. *l.* ovate, sinuate or lobed, 3in. to 6in. long, stellately woolly beneath, prickly, rarely all unarmed. *h.* 2ft. to 8ft. Native country uncertain (widely cultivated throughout the tropics and frequently semi-naturalised). 1597. Greenhouse annual. SYN. *S. esculentum.* There are several garden varieties of this; the following are two of the best: CHINESE BRINJAL, fruit white, long, very juicy, less fibrous than other sorts; LARGE PURPLE, fruit sometimes as much as 6in. or 7in. long, and 1ft in circumference. *See also* **Aubergine.**

S. myrtifolium (Myrtle-leaved). *fl.*, corolla blue, five-parted, the segments broadly ovate, undulated, acute; racemes short, lateral. *l.* lanceolate, glabrous, attenuated at both ends. Branches terete, green. *h.* 3ft. South America. Greenhouse. (L. B. C. 1431.)

S. nigrum (black). Hound Berry. *fl.* few, drooping; calyx lobes obtuse; corolla white, ⅓in. to ⅔in. in diameter, the lobes ciliated, recurved; cymes lateral, umbellate. *fr.* black, yellow, or red, ⅓in. in diameter. *l.* rhomboid-ovate, narrowed into the petioles, 1in. to 3in. long, sinuate or toothed. Stem erect, 6in. to 2ft. high, usually tubercled. Europe (Britain), &c. Annual. (Sy. En. B. 931.)

FIG. 498. SOLANUM MARONIENSE.

Solanum—*continued.*

S. n. miniatum (scarlet). *fr.* scarlet. *l.* toothed. Kent. (Sy. En. B. 932.)

S. oxycarpum (sharp-fruited). *fl.* borne in loose, few-flowered cymes. *fr.* ellipsoid, cuspidate. *l.* distinctly petiolate; leaflets nine to eleven, oblong-lanceolate, acuminate. Stem short and slender. Tubers minute. Mountains of Central Mexico. Hardy perennial. This species is not in cultivation.

S. platanifolium (Plane-leaved). *fl.*, calyx small, five-cleft, prickly in fruit; corolla diluted with violet, seven to eight lines in diameter, five-parted; peduncles usually one-flowered, unarmed. *fr.* beautifully variegated with green and white, at length yellow, 1¼in. in diameter. *l.* petiolate, five-lobed, 3½in. long; lobes irregularly incised, ciliated on the margins. Stem hairy, sparsely prickly. *h.* 3ft. to 4ft. Northern South America. Greenhouse sub-shrub. (B. M. 2618.)

S. Pseudo-capsicum (false Capsicum).* Jerusalem Cherry. *fl.*, corolla white, five-parted; pedicels solitary or few in a lateral fascicle; common peduncle scarcely any. *fr.* scarlet, rarely yellow, globose, about ½in. in diameter. *l.* oblanceolate or oblong, often repand, bright green and shining, narrowed at base into short petioles. *h.* 4ft. Madeira, 1596. Greenhouse. A few handsome hybrids have been raised from this species.

S. P.-c. rigidum (rigid). *fr.* bright orange-colour, globose. A fine, ornamental, garden hybrid. 1868.

S. P.-c. Weatherilli (Weatherill's). *fr.* bright orange-coloured, oval, pointed. *l.* strongly-veined, wavy. 1868. A handsome shrub.

S. pyracanthum (fire-thorn).* *fl.*, calyx five-cleft; corolla bluish-violet, 1in. in diameter, the segments cuspidate; peduncles 2in. long; racemes cymose, simple, many-flowered. *l.* petiolate, oblong, acuminate, acute, unequal at base, 5in. to 6in. long, pinnatifid, the lobes ovate-lanceolate. Stem 3ft. to 6ft. high, terete, leafy. Madagascar, 1789. A handsome, greenhouse, prickly sub-shrub. (B. M. 2547; F. d. S. 2411.)

S. quercifolium (Oak-leaved). *fl.*, calyx five-toothed; corolla violet, four or five times longer than the calyx, five-cleft, the segments acute; racemes terminal, at length lateral, 2in. to 3in. long. *l.* imparipinnatifid, slightly glabrous, five to seven-lobed, decurrent into the petioles, slightly ciliated, 2½in. to 3½in. long; lobes ovate-oblong, obtuse or acute. Stem 3ft. to 5ft. high, scabrous. *h.* 2ft. Peru, 1787. Hardy perennial.

S. quitense (Quito). *fl.* pedicellate, clustered; calyx seven to eight lines in diameter, five-cleft; corolla violet and woolly outside, white within, nearly 1in. in diameter, five-parted; racemes 1in. long, four or five-flowered. *fr.* globose, the size of a small orange, fragrant, edible. *l.* cordate, sinuate-angled; lower ones 1ft. to 1½ft. long; upper ones in pairs, one being much smaller; all softly woolly; petioles very hairy, 2in. to 2½in. long, ochraceous-rufescent. Stem suffruticose. *h.* 4ft. to 6ft. Peru. Greenhouse. (B. M. 2739.)

S. robustum (robust).* *fl.* clustered; calyx cyathiform, nearly five-parted; corolla white, ovoid, 1in. in diameter, five-parted; racemes 1½in. to 2in. long. *fr.* globose, hairy, ferruginous-orange. *l.* ovate-elliptic, acuminate, sinuate-lobed, green and tomentose-velvety above, ochraceous-ferruginous and woolly-tomentose beneath, prickly on both sides, 5in. to 8in. or more long. Branches robust, densely woolly-tomentose, prickly. *h.* 2ft. to 4ft. Brazil, 1868. A vigorous and highly ornate, sub-arborescent plant, well suited for the sub-tropical garden. (Ref. B. 37.)

S. runcinatum (runcinate). *fl.* drooping, forming a compound cyme; corolla bright purple, with five blood-red, starry points radiating from the base of the lobes; anthers yellow, large. *l.* alternate, 2in. to 3in. long, with five or nine undulated segments, waved at the margins, but otherwise entire. Stems procumbent or ascending. *h.* 2ft. Chili, 1839. Greenhouse perennial. (B. M. 5222; S. B. F. G. ser. ii. 177.)

S. saponaceum (soapy). *fl.*, calyx cyathiform, deeply five-cleft; corolla bluish-violet or white, thrice as long as the calyx, deeply five-cleft, ¾in. in diameter; corymbs 2in. to 3in. long and broad, dichotomous. *fr.* orange, globose. *l.* petiolate, linear-oblong, entire. Stem erect, branched, with a few remote prickles. *h.* 4ft. Peru, 1825. Greenhouse. (B. M. 2697.)

S. Seaforthianum (Seaforth's).* *fl.*, calyx small, minutely five-toothed; corolla pale red or lilac, deeply five-cleft, scarcely ½in. long; pedicels diverging; cymes peduncled, lateral, paniculate. *fr.* yellowish-red, globose. *l.* petiolate, ovate, pointed, entire, 1½in. to 3in. long; lower ones (or all) pinnately divided, the terminal segment 1½in. to 3in. long. West Indies, 1804. Stove trailer. (A. B. R. 504; B. M. 1982; B. R. 969; L. B. C. 971; B. M. 5823, under name of *S. venustum.*)

S. sisymbriifolium (Sisymbrium-leaved).* *fl.* racemose; calyx five-parted; corolla light blue or white, 1in. or more in diameter, five-lobed. *fr.* red, globose. *l.* deeply pinnatifid; lobes oblong, sinuate, or even again somewhat pinnatifid. *h.* 4ft. Brazil, North America (escaped from cultivation). Greenhouse annual or perennial, much armed with prickles. (B. M. 2568; B. 49, under name of *S. Balbisii*; B. R. 140, under name of *S. decurrens.*)

S. s. acutilobum purpureiflorum (acutely-lobed, purple-flowered). *fl.* purple. *l.* pinnatifid. (B. M. 2828, under name of *S. Balbisii purpurea.*)

Solanum—*continued.*

S. s. bipinnatipartitum (bipinnatipartite). *fl.* white or purple. *l.* bipinnately parted. (B. M. 3954, under name of *S. Balbisii bipinnata.*)

S. somniculentum (sleep-giving). *fl.*, calyx nearly hemispherical, small, ten-cleft; corolla diluted with violet, 2in. broad, five-plicate and angled; peduncles axillary, one-flowered. *l.* solitary or twin, petiolate, ovate, acuminate, oblique and acute at base, 2½in. long. Stem erect, branched, pilose. *h.* 1½ft. Mexico. Greenhouse. (F. d. S. v. 454.)

S. stelligerum (star-bearing). *fl.* rather small, in lateral racemes; calyx lobes narrow; corolla blue, deeply divided. *fr.* red, globular, small. *l.* petiolate, lanceolate or ovate-lanceolate, acute or acuminate, rarely broad and obtuse, usually 2in. to 4in. long. *h.* 6ft. or less. Australia, 1823. An erect, slightly prickly, greenhouse shrub. (S. E. B. ii. 88.)

S. texanum (Texan). *fl.* drooping; calyx stellate-pilose, seven or eight-cleft; corolla whitish-violet, rotate, deeply five-cleft; peduncles solitary, one-flowered. *fr.* scarlet, torulose, depressed, 1¾in. in diameter, resembling tomatoes. *l.* long-petiolate, unequally sub-cordate, sinuate-repand, 5in. to 8in. long; lobes short and slightly obtuse, with violet prickles beneath. Stem 1ft. or more high, simple, almost unarmed, purplish. Texas, &c., 1861. Half-hardy annual. (F. d. S. 1398.) "*S. texanum* is probably not Texan, although raised from seeds said to have been collected there. It is probably *S. integrifolium* of Poiret" (Gray, "Synopsis").

S. Torreyi (Torrey's). *fl.* large and handsome; calyx often six lobed; corolla violet, rarely white, 1½in. in diameter, the lobes broadly ovate; cymes at first terminal, loose, two or three-cleft. *fr.* yellow, globose, 1in. in diameter. *l.* ovate, with a truncate or sub-cordate base, sinuately five to seven-lobed, 4in. to 6in. long; lobes entire or undulated, obtuse, unarmed. Prickles small and subulate, scanty, sometimes nearly wanting. *h.* 1ft. to 2ft. Texas and Arkansas, 1878. Half-hardy perennial. (B. M. 6461.)

S. trilobatum (three-lobed). *fl.*, calyx small, green; lobes ovate, sub-acute; corolla 1in. to 1¾in. in diameter, violet, blue, or white; lobes ovate-oblong, obtuse, the midrib of each white at the base, giving a stellate appearance to the base of the corolla; peduncles solitary or accompanied by a single-flowered pedicel, three to six-flowered. *fr.*, berry scarlet, globose, size of a large pea. *l.* 1in. to 3in. long, oblong, rounded, or ovate, sinuately three to five-lobed, smooth, shining. Stem, petioles, midrib, sometimes the nerves of the leaf beneath, and often the peduncles, armed with stout, recurved prickles. *h.* 2ft. to 5ft. East Indies, 1759. A prostrate, rambling, or climbing, nearly glabrous undershrub. (B. M. 6866.)

S. tuberosum (tuberous-rooted). Potato. *fl.*, corolla lilac or white, with short, deltoid segments. *fr.* usually globose. *l.* shortly petiolate; leaflets many-jugate, ovate or oblong, acute. Tubers large. *h.* 3ft. more or less. South America, 1597. (J. H. S. i. 1-4; T. H. S. v. 11.) For culture, enumeration of varieties, &c., *see* **Potato.** Several so-called tuberous-rooted species are referred, by Mr. Baker, to *S. tuberosum* as mere varieties.

S. t. demissum (humble). *fl.*, calyx five-cleft, the segments triangular, acuminate; corolla violet, circular, ten-toothed. *fr.* spheroid, glabrous. *l.* somewhat interruptedly pinnate; leaflets rounded-obovate. Root tuberous. Mexico, 1846. A prostrate, hardy perennial. (J. H. S. iii. 69, under name of *S. demissum.*)

S. t. etuberosum (non-tuberous). *fl.* large, borne in rich clusters; calyx segments not pointed; corolla of a bright purple, with a golden-yellow centre. *l.* nearly glabrous. Tubers wanting. Chili, 1833. (B. R. 1712, under name of *S. etuberosum.*)

S. t. verrucosum (warted).* *fl.* deeply coloured, large. *fr.* dotted all over with white, raised points. *l.*, leaflets fewer than in the type, ovate, acute, densely hairy beneath; petiole longer. Tubers smaller, of excellent taste, with yellow flesh. Mexico. (R. H. 1853, 6, under name of *S. verrucosum.*)

S. Tweedianum (Tweedie's). *fl.* large, nodding, in umbellate racemes; calyx deeply five-cleft; corolla white or pale blue, rotate, semi-five-cleft. *l.* sub-cordate, ovate, acute, angular-toothed at the base, on long petioles. *h.* 1½ft. Buenos Ayres, 1833. Greenhouse perennial. (B. M. 3385.)

S. uncinellum (slightly hooked). *fl.*, calyx campanulate, with four rounded teeth; corolla rose-coloured, at length spreading, five-parted; panicle terminal, simple. *l.* entire, ovate-lanceolate, sub-cordate, obsoletely pubescent. Stem decumbent, filiform, pubescent. Brazil, 1837. Stove perennial. (B. R. 1840, 15.)

S. venustum (charming). A synonym of *S. Seaforthianum.*

S. Wallisii (Wallis'). *fl.* in loose, pedunculate cymes; corolla purple, 1in. to 1½in. in diameter; peduncles blackish-violet. *fr.* violet, marbled and spotted with a paler colour, large, plum-shaped, edible. *l.* simple, lanceolate, acuminate, entire, 3in. to 4in. long, 1½in. to 2in. broad, dark purplish-green; petioles and nervures (as well as the stem) blackish-violet. *h.* 2ft. Peru, 1877. A compact and bushy, stove or greenhouse species. (R. H. 1877, p. 291.)

S. Warscewiczii (Warscewicz'). *fl.* white, numerous; *l.* large, soft, oval sub-cordiform, deeply nine-lobed; petiole and midrib

Solanum—*continued.*

covered with red, stellate prickles. Native country unknown. Suffrutescent, armed with prickles, half-hardy. A garden species. (R. H. 1865, p. 430.)

S. Wendlandii (Wendland's). *fl.* lilac-blue, 2½in. in diameter; cymes 6in. and more across, terminating pendulous branches. August. *l.* bright green, variable, 2in. to 10in. long, 1½in. to 4in. broad; uppermost ones simple, oblong, acuminate, with a cordate base, or three-lobed, with the lobes sub-equal or unequal, and sometimes lobed at the sides, or trifoliolate with equal or unequal leaflets; lower leaves on the branches 6in. to 10in. long, pinnate below and pinnatifid above, with four to six pairs of lobes or leaflets, which are ovate or oblong, entire and acuminate; prickles on the stems, branches, and petioles few, scattered, short, hooked. Costa Rica, 1882. Climbing, glabrous, stove shrub. (B. M. 6914.)

SOLARIA (named in honour of Francisci de Borja Solar, an eminent Chilian mathematician). SYN. *Symea.* ORD. *Liliaceæ.* A monotypic genus. The species is a remarkable, greenhouse, bulbous plant. It thrives in a compost of sandy loam and leaf mould. The bulbs must be kept nearly dry during their resting period, the quantity of water being gradually diminished as the leaves begin to die down. Propagation may be effected by seeds, or by offsets.

S. miersioides (Miersia-like). *fl.* green, small, inconspicuous, pedicellate, erect, many in a terminal umbel; perianth segments connate at base in a shortly campanulate tube, spreading above; stamens three; involucral bracts two, scarious; scape simple, leafless. Spring. *l.* (? always) radical, solitary, broad-linear. *h.* 4in. Chili, 1871. SYN. *Symea gillesioides* (Ref. B. 260).

SOLAR INFLUENCE. Inasmuch as all life on the earth depends upon the warmth and light of the sun, it follows that Solar Influence upon plants is of the most far-reaching kind. The conversion of mineral compounds and gases into food suitable for the nourishment of plants, goes on only during light in their green parts, where chlorophyll exists; on this food, formed in their tissues, all green plants subsist, and all parasitic plants and animals are nourished indirectly by it, as they feed on living or dead plants. But, apart from this, the most important of all influences upon plant-life, the sun exerts certain other powers; and it is necessary for gardeners to take advantage of these, or to ward off the evils resulting from their action, according to the requirements of the plants affected.

Leaving untouched the subject of the Sun's Influence in regulating the seasons, the present article will deal only with the effects of exposure to the sun's rays during the season of active vegetation. All are familiar with the fact that the sun gives both heat and light. To a certain extent, the heat-rays may be converted into light, or the light-rays into heat; but this need not be taken account of here. The heat-rays are the chief source of heat with which we are acquainted, and, except in hotbeds and hothouses, they are the only source available in horticulture. They originate the vital processes of germination in seeds, and of the bursting of new buds and leaves on the bare branches in spring. But, in dry summers, and especially in confined situations, fully exposed to the sun's rays, the air and the soil become parched with drought, and plants perish for lack of water. This danger must be warded off by watering the plants, or by irrigation, if that is practicable; and subjects that are peculiarly liable to injury from drought should be protected under some kind of shelter, such as an awning. A temperature higher than that to which a plant is accustomed, if continued for some time, is apt to induce in it a weak habit of growth, owing to over-stimulation; new branches and leaves being produced more rapidly than food can be supplied for their full development. Certain injurious effects of exposure to too great heat of the sun will be treated of under **Sun-burning**.

Plants differ a good deal in the amount of *light* that they require. Most green plants need to be exposed to full sunshine for some part of each day; and if this, or, at least, full daylight, is withheld, they turn pale and sickly, and, sooner or later, perish. On the other hand, many Ferns, and a few flowering plants, suffer in health when exposed to bright sunshine: these plants require shady places, *e.g.*, shade of dense forests or caves. In gardens, they require special protection from light, and are usually shaded by green glass, or by green paint on the glass, or, better, by thin green cloth, as this can be removed in dull, cloudy weather.

Like heat, light sometimes proves too great a stimulus, and plants suffer from excess of it. In greenhouses, plants not unfrequently have their leaves marked with dry spots, that look as if scorched through the tissues. For their supposed causes, and for the most successful preventive treatment, *see* **Sun-burning**.

SOLDANELLA (a diminutive of *solidus*, a piece of money; alluding to the shape of the leaves). ORD. *Primulaceæ.* A small genus (three or four species) of very pretty, mostly hardy, glabrous, perennial herbs, inhabiting the Alps of Central Europe. Flowers blue, violet, or rose, rarely white, nodding; calyx five-parted, persistent; corolla hypogynous, infundibular-campanulate, five-lobed to the middle, the lobes imbricated; stamens affixed to the throat of the corolla; scapes slender, solitary or few, one-flowered or umbellately many-flowered. Leaves long-petiolate, thick, cordate-orbicular or reniform, entire. *S. alpina* is one of the most charming alpine plants in our gardens. The species succeed in a peat border, or in pots of peat and loam. Propagation may be effected by seeds, or by division.

FIG. 499. SOLDANELLA MONTANA.

S. alpina (alpine).* Blue Moonwort. *fl.* violet, fimbriated, pendent; style equalling or exceeding the corolla; pedicels pubescent, slightly glandular; scapes two to four-flowered. April. *l.* roundish-reniform, entire or sub-repand, or loosely and remotely ciliated. *h.* 3in. 1656. (B. M. 49; F. d. S. 994; J. F. A. 118.) A variety, *Wheeleri*, is the most floriferous form of this plant.

S. Clusii (Clusius'). *fl.* blue, campanulate, with a neatly notched margin; style shorter than the corolla; pedicels slightly scabrous, with minute, sessile glands; scape one, rarely two-flowered. April. *l.* cordate-reniform, slightly repand. *h.* 2in. to 3in. 1820. (B. M. 2163.) SYN. *S. pusilla* (S. B. F. G. ser. ii. 48).

S. minima (smallest). *fl.* suffused with lilac, purple-striped within, cut one-third its length, spreading; style shorter than the corolla; pedicels pubescent; scapes one-flowered. April. *l.* orbicular. *h.* 2in. 1823. (S. B. F. G. ser. ii. 53.)

Soldanella—*continued.*

S. montana (mountain).* *fl.* purple; corolla cut to the middle, equalled or exceeded by the style; pedicels shortly glandular-pubescent; scapes two to four-flowered. April. *l.* nearly round, loosely and remotely crenated. *h.* 3in. 1816. See Fig. 499. (S. B. F. G. 11.)

S. pusilla (small). A synonym of *S. Clusii.*

SOLEA. A synonym of **Ionidium** (which *see*).

SOLENA. A synonym of **Posoqueria** (which *see*).

SOLENANDRA (of Beauvois). A synonym of **Galax** (which *see*).

SOLENANTHA. A synonym of **Hymenanthera** (which *see*).

SOLENANTHUS (from *solen*, a tube, and *anthos*, a flower; alluding to the shape of the corolla). ORD. *Boragineæ.* A genus comprising about ten species of hardy, perennial herbs, inhabiting South Europe, and West and Russian Asia. Flowers blue or pink, racemose; calyx five-parted; corolla tubular or nearly funnel-shaped, with a limb of five small lobes. Leaves alternate. *P. circinatus* has been introduced, but is probably not now grown.

SOLENIDIUM (from *solen*, a tube, and *eidion*, appearance; in allusion to the shape of the flower). ORD. *Orchideæ.* A monotypic genus. The species is a curious, stove, epiphytal orchid, with the habit of *Oncidium.* It differs in the crest of its lip consisting of a pair of long, feathery, raised plates, and in one or two other technical details. For culture, *see* **Oncidium.**

S. racemosum (racemose). *fl.* yellow, spotted with red, mediocre, long-pedicellate, in a loose raceme; sepals and petals free, spreading; lip spreading at the base of the column, contracted in a long claw; scapes axillary under the pseudo-bulbs, simple. November. *l.* rather long, ensiform, thinly coriaceous, narrowed at base. Stem shortened, terminating in a one or two-leaved pseudo-bulb. *h.* 6in. Andes of Columbia. (L. & P. F. G. iii. 102.)

SOLENOMELUS (from *solen*, a tube, and *melos*, a limb; in allusion to the tubular perianth). SYNS. *Cruikshankia, Lechlera.* ORD. *Irideæ.* A small genus (two species) of half-hardy, rhizomatous plants, natives of Chili. Flowers many in a spathe, shortly pedicellate; perianth yellow, with a slender tube and spreading lobes; stamens affixed to the throat; spathe terminal, or a few on long peduncles. Leaves radical or clustered at the base of the stem, linear, and a few at the sides of the stem. Stems sometimes slightly thickened at base. For culture of *S. chilensis*, the only species introduced, *see* **Sisyrinchium.**

S. chilensis (Chilian). *fl.*, perianth deep yellow, the segments obovate, spreading, a little concave in their lower half, and there narrow, with a small, dark purple spot at the very base; spathe four or five-flowered; peduncles solitary or two to four. June. *l.*, radical ones 6in. to 8in. long; cauline ones remote, gradually shorter upwards, linear-ensiform, sheathing at base. Stems 1ft. to 1½ft. high, zigzag, leafy. 1868. SYNS. *Sisyrinchium longistylum* (F. d. S. 255), *S. pedunculatum* (B. M. 2965).

SOLENOPHORA (from *solen*, a tube, and *pherein*, to bear; in allusion to the tubular form of the corolla). Including *Arctocalyx.* ORD. *Gesneraceæ.* A small genus (four species) of stove, evergreen, branched, scabrous-pubescent shrubs, confined to Mexico. Flowers scarlet or yellow, large, solitary or few, on short, axillary peduncles; calyx tube adnate, the limb five-lobed; corolla tube elongated, with a broad throat, the limb shortly and broadly five-lobed, sub-erect. Leaves opposite, on long petioles, ample, membranous, often dissimilar. *S. Endlicheriana*, the only species introduced, is a handsome plant, requiring culture similar to **Gloxinia** (which *see*).

S. Endlicheriana (Endlicher's). *fl.* of a beautiful orange-colour, marked with purple, solitary or in fascicles of two to five; corolla infundibular-campanulate, hairy without, loosely curved, 2½in. to 3in. long. April. *l.* much spreading, broadly elliptic, acuminate, hairy, the largest 1ft. to 1½ft. long; petioles 3in. to 4in. long. Stem suffruticose, erect, purplish, 1ft. to 2ft. high, emitting aërial roots. 1849. (F. d. S. 546 and L. & P. F. G. i. 69, under name of *Arctocalyx Endlicherianus.*)

SOLENOPSIS. A synonym of **Laurentia** (which *see*).

SOLIDAGO (from *solido*, to join or make whole; alluding to reputed vulnerary qualities). Golden Rod. SYN. *Doria.* ORD. *Compositæ.* A large genus (about eighty species) of mostly hardy, perennial herbs, rarely shrubby at base; they are nearly all North American, one or two being found in South America, one in temperate Asia and Europe, and one in the Azores. Flower-heads usually yellow, small, in racemes or clusters; involucre oblong or narrowly-campanulate, the bracts appressed, many-seriate; ray florets ligulate, spreading, or rarely small and erect; achenes sub-terete or angled. Leaves alternate, entire or often toothed. Owing to the coarse habit of these plants, and the manner in which they impoverish the soil, they are mostly confined to shrubberies and old-fashioned borders, where their bright yellow flowers contrast well with Michaelmas Daisies. Of the large number of species introduced, those described below are probably the best; all are North American, *S. Virgaurea* being also found in Britain. Any common soil is suitable; and propagation may be readily effected by divisions.

S. altissima (very tall). A synonym of *S. rugosa.*

S. canadensis (Canadian). *fl.-heads* small; ray florets very short; panicle ample, crowded. August. *l.* lanceolate, acuminate, sharply serrated (sometimes almost entire), more or less pubescent beneath and rough above. Stem roughly hairy. *h.* 3ft. to 6ft. 1648.

S. Drummondii (Drummond's).* *fl.-heads* small; rays four or five, short; involucral scales oblong, obtuse; racemes short, panicled. Summer. *l.* broadly ovate or oval, somewhat triple-ribbed, coarsely and sharply serrated, some of them almost entire, beneath (as well as the stem) minutely velvety-pubescent. Stem 1ft. to 3ft. high. 1885. (B. M. 6805.)

S. elliptica axilliflora (elliptic-leaved, axillary-flowered). *fl.-heads* rather large, in short, or somewhat elongated and racemiform, erect or spreading clusters, which are mostly axillary and shorter than the leaves. *l.* oval to broadly lanceolate. *S. fragrans* (of Willdenow) is a narrow-leaved form.

S. fragrans (fragrant), of gardens. A synonym of *S. serotina.*

S. fragrans (fragrant), of Willdenow. A form of *S. elliptica axilliflora.*

S. lanceolata (lanceolate-leaved).* *fl.-heads* obconical, mostly sessile, in dense clusters; ray florets fifteen to twenty. September. *l.* linear-lanceolate, entire, roughish above, pubescent on the veins beneath. Stem pubescent above, corymbose. *h.* 2ft. to 3ft. 1758. (B. M. 2546.) SYN. *Euthamia graminifolia.*

S. multiradiata (many-rayed). *fl.-heads* large, in a dense, thyrsoid or corymbose raceme; involucral scales narrow, nearly glabrous; ray florets eight to twelve. July. *l.* ciliated, oblong-lanceolate, acute or obtuse, tapering to the base. Stem villous-pubescent, simple, or rarely branched at the summit. 1776.

S. odora (odorous). *fl.-heads*, ray florets three or four, rather large; racemes spreading, in a small, one-sided panicle. July. *l.* linear-lanceolate, entire, thickish, shining, pellucid-dotted. Stem slender, 2ft. to 3ft. high, often reclined. 1699. The crushed leaves yield a pleasant, anisate odour.

S. patula (spreading). *fl.-heads*, involucral scales oblong; ray florets six or seven; peduncles scabrous-pubescent; racemes mostly short and crowded on the elongated, somewhat leafy branches, at length spreading or recurved. August and September. *l.* large, elliptic, acute, serrated, smooth and glabrous beneath. *h.* 2ft. 1805.

S. rigida (rigid). *fl.-heads* large, in a compound corymb terminating the simple stem, not at all racemose; ray florets seven to ten. September. *l.* oval or oblong, copiously feather-veined, thick and rigid; upper ones closely sessile by a broad base, slightly serrated, the uppermost ones entire. Stem stout, 3ft. to 5ft. high, very leafy. 1710.

S. rugosa (wrinkled). *fl.-heads* small; involucral scales linear; ray florets six to nine; racemes panicled, spreading. August and September. *l.* ovate-lanceolate, elliptical, or oblong, often thickish and very rugose, coarsely and sharply serrated. Stem 2ft. to 7ft. high, roughly hairy. 1686. SYN. *S. altissima.*

S. sempervirens (evergreen). *fl.-heads* showy; ray florets golden, eight to ten; racemes short, in an open or contracted panicle. September. *l.* fleshy, very smooth, entire, lanceolate, slightly clasping, or the lower ones lanceolate-oblong, obscurely triple-nerved. Stem smooth and stout, 1ft. to 6ft. high. 1699.

S. serotina (late). *fl.-heads*, ray florets short; achenes at length nearly glabrous; peduncles roughish-pubescent; panicle pyramidal, of numerous recurved racemes. August to October. *l.* lanceolate, acuminate, serrated, glabrous except on the veins beneath, the margins and usually the upper surface scabrous. Stem often glaucous. *h.* 3ft. 1758. SYN. *S. fragrans* (of gardens).

Solidago—*continued.*

S. speciosa (showy).* *fl.-heads* rather large, somewhat crowded in numerous erect racemes, forming an ample, pyramidal or thyrsiform panicle; ray florets about five, ample. October. *l.* thickish, rough, with smooth margins, oval or ovate, slightly serrated; lower ones 4in. to 6in. long (in the larger forms), contracted into a margined petiole; uppermost ones oblong-lanceolate. Stem stout, smooth, 3ft. to 6ft. high. 1817. A handsome species.

S. Virgaurea. Common Golden Rod. *fl.-heads* crowded; ray florets ten to twelve, spreading. July to September. *l.* linear- or lanceolate-oblong, 1in. to 4in. long, obscurely toothed, obtuse or acute. Stem erect, sparingly branched. *h.* 4in. to 2ft. North America, Europe (Britain), &c. (Sy. En. B. 778.) The variety *cambrica* (Sy. En. B. 779) is a dwarf form, found on rocky mountain ledges.

SOLITARY. Growing singly.

SOLLYA (named after Richard Horsman Solly, 1778-1858, a vegetable physiologist and anatomist). ORD. *Pittosporeæ.* A small genus (two species) of ornamental, greenhouse, evergreen twiners, confined to Australia. Flowers blue, nodding, on slender pedicels, in terminal, loose, few-flowered cymes, or rarely solitary; sepals small, distinct; petals spreading from the base, obovate; anthers connivent in a cone round the pistil. Leaves narrow. The species thrive in well-drained, peaty soil. Propagated by cuttings, inserted in sand, under a glass.

S. Drummondi (Drummond's). A synonym of *S. parviflora.*

S. heterophylla (variable-leaved).* Australian Bluebell Creeper. *fl.*, petals four to five lines long; cymes terminal or leaf-opposed, drooping, usually four to eight-flowered, but sometimes with twelve or more flowers. July. *l.* varying from ovate-lanceolate to ovate-oblong, and 1½in. to 2in. or more long, to lanceolate or oblong-linear, and 1in. to 1½in. long, obtuse or slightly acuminate, quite entire, usually narrowed into short petioles. *h.* 6ft. 1830. (B. M. 3523; B. R. 1466.)

S. h. angustifolia (narrow-leaved). *l.* narrow-lanceolate. Branches less twining than in the type. (B. R. 1840, 3, under name of *S. linearis.*)

S. linearis (linear). A synonym of *S. heterophylla angustifolia.*

S. parviflora (small-flowered).* *fl.* blue, small, solitary or two or three in a cyme, on very fine, filiform pedicels; petals about ¼in. long. July. *fr.* ½in. to ¾in. long, tapering to both ends. *l.* lanceolate or oblong-linear, the larger ones often above 1in. long, but in some specimens all under ½in., very shortly petiolate, and thinner than in *S. heterophylla.* 1838. SYN. *S. Drummondi* (R. G. 261, f. 1).

S. salicifolia (Willow-leaved). Most probably a garden variety of *S. heterophylla.*

SOLOMON'S SEAL. *See* **Polygonatum multiflorum.**

SOLOMON'S SEAL, FALSE. *See* **Smilacina.**

SOMMERFELDTIA. A synonym of *Drepanocarpus.*

SONCHUS (from *Sogchos*, the ancient Greek name used by Theophrastus). Sow-thistle. Including *Atalanthus.* ORD. *Compositæ.* A genus comprising about twenty-four species of greenhouse or hardy, annual or perennial herbs sometimes shrubby at base. Flower-heads yellow, mediocre or rather large, irregularly corymbose-paniculate or sub-umbellate, rarely solitary; involucre conical after flowering, the bracts in many series, imbricated; receptacle flat, naked; florets all ligulate; pappus bristles copious. Leaves radical or alternate, the cauline ones often auriculate-amplexicaul, entire, toothed, pinnatifid, or dissected. *S. arvensis* (Corn Sow-thistle) *S. oleraceus* (Hare's Lettuce, Milk Thistle), and *S. palustris*, are included in the British Flora. *S. oleraceus* was formerly used as a potherb. Few of the species boast of any horticultural merit. The four shrubby species described below are sometimes grown in conservatories, on account of their elegant foliage. They thrive in common soil, and may be increased by cuttings, inserted in sand, under a glass.

S. gummifer (gum-bearing).* *fl.-heads* few, in an irregular, glabrous corymb; involucral scales blackish, slightly appressed, acuminate. Summer. *l.* glabrous, pale beneath; sub-radical ones pinnatifid, the lobes triangular, slightly toothed, acuminate, the terminal one lanceolate-oblong; cauline leaves auricled, rounded, amplexicaul. *h.* 2ft. to 3ft. Canary Islands, 1861. (B. M. 5219.)

Sonchus—*continued.*

S. Jacquini (Jacquin's).* Lachuza de Pastor; Pastor's Lettuce. *fl.-heads* deep golden-yellow, 2in. to 3in. in diameter; involucral bracts appressed, slightly woolly, obtuse. March. *l.* crowded, 6in. to 12in. long, 2in. to 3in. broad, spreading and recurved, cordate and half-amplexicaul, oblanceolate, pinnatifid to or beyond the middle, denticulate and ciliate; lobes triangular, acute. *h.* 1ft. to 2ft. Canary Islands, 1882. A stout, erect, slightly-branched herb, with a woody stem below, sparingly clothed here and there with patches of snow-white wool. (B. M. 6142.)

S. pinnatus (pinnate). *fl.-heads* in a corymbose, branched panicle; involucral scales appressed, glabrous, acuminate, linear or scarcely lanceolate. Summer. *l.* glabrous, pinnatipartite; lobes linear-lanceolate, slightly toothed or entire, the terminal one elongated. *h.* 3ft. Madeira, 1777.

S. radicatus (long-rooted). *fl.-heads* in a glabrous, irregular corymb; involucral scales blackish, the outer ones broadly ovate, the inner ones linear-lanceolate. Summer. *l.*, radical ones somewhat lyrately pinnatipartite, glaucous beneath, with ovate, obtuse, slightly toothed lobes, the terminal one obtusely triangular; cauline leaves auricled, rounded, amplexicaul. *h.* 1ft. Canary Islands, 1780. (B. M. 5211.)

SONERILA (from *Sootli-Soneri-ila*, the Khassee name for one of the species). ORD. *Melastomaceæ.* A genus comprising about fifty-three species of stove herbs or small shrubs, of variable habit, glabrous, hairy, or slightly paleaceous, caulescent or stemless and scapigerous, natives of mountainous parts of the East Indies. Flowers often rosy, disposed in scorpioid racemes or spikes; calyx glabrous or bristly, with an oblong, turbinate, or campanulate tube, and a three-lobed, short, often dilated limb; petals three, ovate, obovate, or oblong, acute, acuminate, or obtuse; stamens three, equal (very rarely six, the alternate ones smaller). Leaves equal or dimorphous, frequently membranous, entire or serrulated, three to five-nerved. Several ornamental species have been introduced. They require a damp atmosphere, and should be allowed partial shade. A compost of fibrous peat, broken small, with a little chopped sphagnum, some sand, and small pieces of charcoal or crocks, intermixed, is most suitable. Propagation may be effected by seeds, which ripen freely; or by cuttings, inserted singly in small pots, during spring, and placed beneath a bell-glass, in a propagating house. All flower in the summer.

S. Bensoni (Benson's).* *fl.* rose-purple; stamens six; anthers all yellow, not produced at the base; peduncle upwards and raceme hairy. 1873. "This plant seems exactly *S. speciosa.* The change of habitat and forcing in rich soil in an English stove may have developed the three stamens usually suppressed in the genus (?)" (C. B. Clarke). (B. M. 6049.)

S. elegans (elegant), of Hooker. A synonym of *S. speciosa.*

S. grandiflora (large-flowered). *fl.* mauve; petals nearly ⅜in. long, elliptic; racemes dense-flowered; peduncles short, terminal. *l.* crowded on the branchlets, 1in. to 2in. long, oblong or elliptic, narrowed at both ends, acute, glabrous, bristly-serrated. Stems very woody below, branching round. *h.* 1ft. 1856. (B. M. 5354.)

S. margaritacea (pearl-spotted).* *fl.* rose-coloured, eight to ten in a corymb; peduncles red, terminal, generally surrounded at base by a whorl of sub-sessile leaves. *l.* opposite, oblong- or ovate-lanceolate, acute or acuminate; veins oblique, parallel, very dark glossy-green above, with oval, white, margaritaceous spots, arranged in single lines or series, between them; under surface pale, the veins red-purple. Stems rather weak and sub-procumbent, 8in. to 10in. long, rich scarlet. 1854. (B. M. 5104; F. d. S. 1126.) The variety *argentea* has leaves surfaced with silvery-grey; in *marmorata*, they are banded with silvery-grey.

S. m. Hendersoni (Henderson's).* *fl.* bright lilac-rose, abundantly produced, with prominent, lemon-yellow, arrow-shaped anthers. *l.* ovate, flat, dark olive-green, studded over the whole surface with pearly-white spots. *h.* 6in. to 8in. 1875. A compact and free-flowering plant. (F. M. n. s. 159; I. H. n. s. 230; R. G. 897.)

S. orbiculata (round-leaved). A synonym of *S. speciosa.*

S. speciosa (showy). *fl.* mauve; petals ⅜in. long, round-elliptic, acute; raceme often sub-paniculate, with eight to fourteen flowers, and very hairy. *l.* 2in. to 3in. long, ovate-elliptic, acute, glabrous or nearly so, denticulated or slightly serrated; petioles 1in. to 2in. long. Stem nearly or quite glabrous below, ending in a long peduncle, villous upwards. *h.* 9in. to 12in. 1856. (B. M. 5026; F. d. S. 2442.) SYNS. *S. elegans* (B. M. 4978), *S. orbiculata.*

S. stricta (erect). *fl.* rose-purple, small; petals obovate. *l.* ½in. to 1in. long, lanceolate or elliptic, narrowed at each end, with scattered, lax hairs. Stem 3in. to 7in. high, erect, often branched, more or less puberulo-pubescent, and also with long, lax, spreading hairs. 1848. (B. M. 4394.)

SONNERATIA (named in honour of Pierre Sonnerat, 1749-1814, who travelled into New Guinea, the East Indies, and China, and communicated many new plants to the botanists of Europe). SYN. *Aubletia*. ORD. *Lythrarieæ*. A genus comprising five or six species of highly glabrous, stove shrubs and small trees, inhabiting the tropical sea-shores of the Eastern hemisphere. Flowers ample, ebracteolate, in threes at the tips of the branchlets, or axillary and solitary; calyx thickly coriaceous, with a campanulate tube and a four to eight-lobed limb; petals four to eight, small, or wanting; stamens numerous. Berry sub-globose, ten to fifteen-celled, many-seeded. Leaves opposite, petiolate, coriaceous, oblong, acute or obtuse, entire. The three species known to cultivation require similar treatment to that advised for **Lagerströmia**.

S. acida (acid). *fl.* six-cleft; petals red. June. *fr.* having acrid pulp. *l.* oval-oblong. Branchlets tetragonal. East Indies, 1822. A small tree. The fruits of this species are eaten as a condiment by the Malays.

S. alba (white-flowered). *fl.* white, six to eight-cleft, apetalous. May. *fr.* obconical at base, depressed above. *l.* roundish-oval, 2in. to 4½in. long, rounded or retuse at the apex. Branchlets terete. East Indies, 1824. A small tree.

S. apetala (apetalous). Kambala-tree. *fl.* white, four-cleft, apetalous. June. *l.* ovate-lanceolate. Branchlets terete, pendulous. East Indies, 1826. Tree attaining 40ft., growing in Mangrove swamps flooded by the tide.

SOOT. This substance is employed in gardening, either as a fertiliser, or to prevent or cure insect ravages, or with all these objects combined. It is, in by far the greater proportion of cases, obtained from chimneys, from the smoke of coal fires. Taken from this source, it usually consists of about 12 per cent. water, 35 to 50 per cent. ash, and the rest volatile substances, which are destroyed by complete combustion. The last-named substances are largely composed of Ammonia; this gives a pungent smell, which is rendered much stronger when quicklime and water are mixed with the Soot. There are also various oily substances, possessed of peculiar smells, and certain acids, formed and driven off by heat during the combustion of coal, that become mixed with the Soot. The ash of Soot contains Calcium, Iron, Magnesium, Potassium, and Sodium, combined variously with Phosphoric and Sulphuric Acids; there is also present a small quantity of Silica and Silicates.

The fertilising effect of a top-dressing of Soot is very decided, and seems to be due, in a great degree, to the presence of Sulphate and Chloride of Ammonium; but the other substances may also produce some effect. Soot has been found to greatly benefit Potatoes, when put into the drills. As a remedy against those larvæ that lie underground during the day, and crawl up to feed on the plants at night, Soot is especially useful, if laid rather thickly around the stems; it will also stimulate the plants to healthy growth. It is also frequently scattered as a top-dressing, or along the drills, about the time when any crop is liable to visits of the parent insects intent on egg-laying; in such a case, it acts as a preventive of attacks. Soot is also used, instead of hellebore powder, for scattering over plants attacked by larvæ (*e.g.*, Sawfly larvæ on Currant-bushes), or by perfect insects (*e.g.*, Turnip Flea on Turnips), and gives valuable results when rightly employed; but care must be taken to avoid applying it when the flavour of the crop would be injured.

To cleanse walls from Red Spider, water with which Soot has been mixed till all that can be dissolved from it has been so, is made up with clay till the mixture is of the consistence of thick paint; and then about 1lb. of flowers of sulphur and 2oz. of soft soap are added to each gallon of the compound. To protect the fruit-trees on the walls from the attacks of the mites, this mixture should be applied all over the wall once a year, taking care to close all crevices.

SOPHORA (altered from *Sophero*, the Arabic name for a papilionaceous-flowered tree). Including *Edwardsia* and *Styphnolobium*. ORD. *Leguminosæ*. A genus comprising about twenty-two species of stove, greenhouse, or hardy, evergreen or deciduous trees, shrubs, or rarely perennial herbs, inhabiting the warmer regions of the globe. Flowers white, yellow, or rarely bluish-violet, disposed in simple, terminal racemes, or in a terminal, leafy panicle; calyx teeth short; standard broadly obovate or orbicular, erect or spreading; stamens free or rarely nearly connate in a ring at the base; bracts small; bracteoles none. Pods moniliform, compressed. Leaves imparipinnate; leaflets indefinite, small, exstipellate. The hardy and half-hardy species thrive in well-drained sandy loam, and are most readily raised from imported seeds. The variegated and weeping forms of *S. japonica* must be grafted on the green-leaved type. *S. tetraptera* and *S. t. microphylla* flower freely in many places when planted against a sunny wall, in sheltered spots in the open air; and in the South-west, they do well as standard trees, without the shelter of a wall. The best-known species are described below.

FIG. 500. WINTER STATE OF SOPHORA JAPONICA PENDULA.

S. bifolia (two-leaved). A synonym of *Ammodendron Sieversii*.

S. chrysophylla (golden-leaved). *fl.* yellow, axillary, in short, racemose spikes; petals of the keel elliptic, with the dorsal margin straight. May and June. *l.*, leaflets seventeen, obovate; younger ones clothed with yellow pubescence. *h.* 6ft. to 10ft. Sandwich Islands. Greenhouse, deciduous shrub. SYN. *Edwardsia chrysophylla* (B. R. 738).

S. glauca (glaucous). *fl.* pale purple, in long, racemose spikes; petals imbricated; standard bifid. May and June. *l.*, leaflets twenty-three, alternate, elliptic, mucronate, velvety on both surfaces, as well as the peduncles and branches. *h.* 4ft. to 6ft. Nepaul, 1820. A very showy, half-hardy, deciduous shrub. SYN. *S. velutina* (B. R. 1185).

S. heptaphylla (seven-leaved). *fl.* yellow; racemes opposite, about as long as the leaves. October. *l.*, leaflets alternate or nearly opposite, usually three or four on each side, oblong or obovate-oblong, slightly acuminate, rounded or slightly acute at base, hairy-pubescent beneath, 1in. to 3in. long. *h.* 6ft. Neilgherries, &c., 1830. Hardy, deciduous shrub or small tree.

S. japonica (Japanese).* Chinese or Japanese Pagoda-tree. *fl.* whitish or cream-coloured, small; panicles loosely-branched, terminal, large. August and September. *l.* graceful, deep bluish-

Sophora—*continued.*

green, pinnate; leaflets eleven to thirteen, oblong-ovate, acute. Naked young wood dark green. *h.* 30ft. to 40ft. China, 1763. A very handsome, hardy, deciduous tree. China and Japan. (A. B. R. 585.) SYN. *Styphnolobium japonicum.*

S. j. pendula (pendulous). An exceedingly beautiful tree of the "weeping" class. See Fig. 500.

S. j. variegata (variegated). A form with variegated leaves, but not particularly ornamental.

S. macrocarpa (large-fruited). *fl.* yellow; racemes short, axillary. April. Pods silky, wingless. *l.*, leaflets thirteen to nineteen, elliptic-oblong, obtuse, coriaceous, silky beneath. *h.* 8ft. to 10ft. Chili, 1822. An elegant, greenhouse, evergreen shrub. (L. B. C. 1125.) SYN. *Edwardsia chilensis* (B. R. 1798).

S. secundiflora (side-flowering).* *fl.* violet, rather large, secund; racemes terminal, crowded. June. *l.*, leaflets nine to thirteen, elliptic-oblong, obtuse, coriaceous, smoothish. *h.* 6ft. Mexico, 1820. A beautiful, greenhouse, evergreen shrub. (R. H. 1854, 201.)

S. tetraptera (four-winged).* *fl.* yellow, 1in. to 2in. long; wings linear-oblong; racemes axillary, pendulous, four to eight-flowered. May. *l.* 1in. to 6in. long; leaflets six to forty pairs, broadly obcordate to linear-oblong, ¼in. to ¾in. long, rounded, retuse, or two-lobed at the tip, silky or densely villous on old plants. *h.* 6ft. to 12ft. New Zealand, 1772. Half-hardy, deciduous tree. (G. C. n. s., ix. 729.)

S. t. grandiflora (large-flowered). Kowhai. *fl.* 2in. long, narrower than in the type. *l.*, leaflets ten to thirty pairs, usually narrow. Trunk sometimes 1ft. to 3ft. in diameter. A large and robust variety. (B. M. 167, under name of *S. tetraptera.*)

S. t. microphylla (small-leaved). New Zealand Laburnum. *fl.* 1in. to 1½in. long, broader than in the species. *l.*, leaflets on old plants thirty to forty pairs, oblong-obcordate. Young branches very slender and flexuous, with few obcordate, membranous leaflets. SYNS. *Edwardsia Macnabiana* (B. M. 3735), *E. microphylla* (B. M. 1442.)

S. tomentosa (tomentose). *fl.* yellow, showy; racemes elongated. August. Pods stipitate, 5in. long. *l.*, leaflets eleven to seventeen, oblong, coriaceous, becoming smooth above. *h.* 4ft. to 6ft. North America, &c., 1739. A half-hardy, deciduous, hoary-tomentose shrub. (B. M. 3390.)

S. velutina (velvety). A synonym of *S. glauca.*

SOPHRONANTHE. A synonym of **Gratiola** (which *see*).

SOPHRONITIS (from *sophron*, modest; in reference to the pretty little flowers of the original species). ORD. *Orchideæ.* A small genus (four or five species) of dwarf-growing, tufted, cool-house, epiphytal orchids, inhabiting the Organ Mountains of Brazil. Flowers very showy, scarlet or violet, borne in short, few-flowered racemes, or solitary from the top of the pseudo-bulb; sepals free, equal, flat, spreading; petals similar or broader; lip erect, the lateral lobes broad and connivent, wholly concealing the short and rather thick column, the middle lobe sub-recurved, entire; pollen masses eight. Leaves coriaceous or fleshy, complicated, at length unfolding, spreading. Pseudo-bulbs clustered on a rhizome, one or two-leaved. The species are well worthy the attention of cultivators, and have the advantage of occupying but little space. They require to be grown in small pans, or on blocks or rafts. The material they prefer is very fibry peat, to which may be added a little crushed charcoal. Perfect drainage is necessary. All the Sophronites require abundance of moisture throughout the year. Propagation may be effected by divisions, made just as growth commences.

S. cernua (drooping). *fl.* rose-red, yellowish in the centre, small, produced in short, effuse, axillary racemes; column white, with dark purple wings. Winter. *l.* solitary, ovate, apiculate, rather above 1in. long. *h.* 3in. 1827. (B. M. 3677; B. R. 1129; L. & P. F. G. iii. p. 11.)

S. coccinea (scarlet). A synonym of *S. grandiflora.*

S. grandiflora (large-flowered).* *fl.* brilliant scarlet or cinnabar-red, of stout substance, over 3in. in diameter, solitary; sepals linear-oblong, obtuse; petals three times as wide as the sepals; lip undivided, ovate, cucullate at base. Winter. *l.* solitary, oblong, acute, dark green. Stems short, ovate, terete. A very beautiful species. SYNS. *S. coccinea* (F. d. S. 1716), *Cattleya coccinea.* A remarkable hybrid between this species and *Cattleya intermedia*, raised by Messrs. Veitch, five years ago, produced flowers in 1886, and has been described by Reichenbach, in the "Gardeners' Chronicle," n. s., vol. xxvi., p. 263, under name of *Lælia Batemaniana.* This plant has the short peduncle of a

Sophronitis—*continued.*

Sophronitis and a short-stalked, Lælia-like flower of a light purple rose-madder, with the very lightest mauve hue, which appears to get deeper as the flower gets older; the middle lacinia of the trifid lip is of the warmest Dahlia carmine, with a light mauve hue; the side laciniæ and disk are white, with a light mauve-purple border. The change in nomenclature brought about by this extraordinary cross is given in Prof. Reichenbach's words: "Hence I must reduce Sophronitids as *Lælia cernua, pterocarpus, militaris, purpurea, grandiflora*, for those who accept changes, and leave alone *Sophronitis violacea* with a remodelled character."

S. g. purpurea (purple). *fl.* purplish; petals blunt. *l.* cuneate-elliptic, acute. Pseudo-bulbs very short, thick, fusiform. 1878.

S. g. rosea (rosy). *fl.* of a clear rosy-lake or carmine-rose. A rare form. (Gn. xxv., p. 474.)

S. grandiflora (large-flowered), of Hooker. A synonym of *S. militaris.*

FIG. 501. STEM AND FLOWERS OF SOPHRONITIS MILITARIS.

S. militaris (military).* *fl.* solitary, fully 3in. across; sepals and petals bright cinnabar or deep crimson, the former oblong-lanceolate, the latter roundish-elliptic; lip yellow, streaked with bright red, three-lobed, the side lobes incurved, the front one flat and acuminate. November and December. *l.* solitary, elliptic. Pseudo-bulbs oblong-cylindrical. *h.* 6in. 1837. The finest species in the genus; it should be found in every collection. See Fig. 501. SYN. *S. grandiflora* (B. M. 3709; F. M. 329; L. & P. F. G. iii., p. 11, f. 237; L. S. O. 5; P. M. B. ix. 193).

S. pterocarpa (wing-fruited). *fl.* rosy-purple; lip ovate, crested; ovary six-winged, long-beaked; raceme short, corymbose. March. *l.* coriaceous, roundish-oblong. *h.* 3in. 1842. A rare plant in gardens. (L. & P. F. G. iii., p. 11, f. 239.)

S. violacea (violet).* *fl.* violet, solitary; lip obovate, acute, naked, gibbous at base; column with large, fleshy, obtuse, falcate wings; scape terminal, many-bracted at base. Winter. *l.* solitary, linear, dark green, longer than the scape. Pseudo-bulbs oval, small. *h.* 3in. 1838. (B. M. 6880; L. & P. F. G. iii., p. 11, f. 238.)

SOPUBIA (said to be a native name in the East Indies). SYNS. *Gerdaria, Raphidophyllum.* ORD. *Scrophularineæ.* A genus comprising eight or nine species of stove, erect, usually annual herbs, natives of tropical and Southern Africa, Madagascar, the East Indies, the Malayan Archipelago, and Australia. Flowers bracteate, spicate or racemose; calyx campanulate, five-toothed or five-lobed; corolla with a short tube and five broad, spreading lobes; stamens four, didynamous; pedicels bibracteolate. Leaves opposite, or the upper ones alternate, narrow, often laciniate. *S. delphinifolia* appears

Sopubia—*continued*

to be the only species introduced to our gardens. It is a handsome perennial, thriving in peaty soil; it may be increased by cuttings, inserted under a glass, or by seeds.

S. delphinifolia (Delphinium-leaved). *fl.* rose-coloured, sub-sessile; corolla sub-campanulate, 1in. to 1½in. long, 1in. in diameter. July. *l.* 1in. long, pinnatisect; segments almost as long, few, filiform, flexuous. Stem erect, four-grooved, 3ft. to 4ft. high, spotted with purple. India, 1800. SYN. *Gerardia delphinifolia.*

SORANTHE. A synonym of **Sorocephalus** (which *see*).

SORBUS. Included under **Pyrus** (which *see*).

SORDID. Any dirty or muddy colour.

SOREDIATE. Bearing small patches on the surface.

SOREMA. A synonym of **Nolana** (which *see*).

SOREMA. A heap of carpels belonging to the same flower.

SORGHUM (said to be from *Sorghi*, the Indian name). Millet Grass. SYN. *Blumenbachia* (of Koeler). ORD. *Gramineæ.* A genus consisting, according to the authors of the "Genera Plantarum," of only a couple of species of half-hardy or greenhouse, annual or perennial grasses, inhabiting the warmer parts of the globe, and more or less extending into temperate regions, one being nearly cosmopolitan. Spikelets numerous, ternate, the central one sessile, the lateral ones pedicellate; panicle terminal, ample, dense or effuse. Leaves flat, often long and broad. *S. vulgare* (Indian Millet) has been tried in England as a general crop, but the climate has been found too cold and damp for the proper ripening of its seeds; the plant is frequently grown in botanic gardens, but has no interest from a horticultural point of view. It is extensively cultivated as an article of food in warmer countries. *S. halepense* is a handsome, hardy species, thriving in ordinary garden soil. Increased by seeds, or by divisions.

S. halepense (Aleppan). *fl.* purplish; panicle 3in. to 12in. or more long, loose and often much branched. *l.* long and flat, often rather broad, the midrib usually white and prominent. Stems erect, 2ft. to 10ft. high, the nodes glabrous. Mediterranean region, &c.

SORINDEIA (said to be the native name in Madagascar). ORD. *Anacardiaceæ.* A genus comprising about half-a-dozen species of small, stove, glabrous trees, natives of tropical Africa, Java, and Madagascar. Flowers purple or yellow, small; calyx cup-shaped, five-toothed; petals five, rarely more, valvate; stamens in hermaphrodite flowers, five, in males ten to twenty; panicles terminal, branched, bracteate, sparse-flowered. Drupes compressed, one-seeded. Leaves alternate, imparipinnate; leaflets entire. *S. madagascariensis* is the only species introduced. Its fruits have been described as "of a pleasant, sweet-sour, mango taste, but acrid also. These groups grow in a remarkable and interesting way, not only from the branches, but chiefly from the main trunk of the tree, looking as if they were air-roots with fruit upon them, or like parasites. There may be 200 of the tempting fruits hanging in great bunches, 2ft. in length." For culture, *see* **Anacardium.**

S. madagascariensis (Madagascar). *fl.* purple, small, in axillary racemes. May. *l.* on woody petioles. *h.* 10ft. Madagascar, 1828.

SOROCEPHALUS (from *soros*, a heap, and *kephale*, a head; alluding to the clustered heads of flowers). SYN. *Soranthe.* ORD. *Proteaceæ.* A genus embracing about ten species of greenhouse, erect or rarely diffuse, Heath-like, densely leafy shrubs, confined to South Africa. Flowers in small heads, clustered in corymbose or capitate spikes; perianth slender, the limb globose or oblong. Leaves scattered, clustered, or nearly imbricated, lanceolate or narrow, sometimes subulate, entire, or the lower ones dissected. A selection of the best-known species is here given. Some of them should be seen in every collection. For culture, *see* **Protea.**

Sorocephalus—*continued.*

S. diversifolius (variable-leaved). *fl.* purple; heads as large as a small plum, solitary, sessile, ovate, obtuse. June. *l.* spathulate-lanceolate, smooth, glabrous; lowest ones 2in. long, trifid-bipinnatifid, channelled; upper ones ½in. long, undivided, imbricated, slightly obtuse, sub-concave. Stem slender, nearly simple, pubescent above. *h.* 2ft. to 6ft. 1803.

S. imbricatus (imbricated). *fl.* lilac, four to five lines long, the lamina bearded; heads sub-ovate, as large as a plum, often two or three aggregate; peduncle scarcely ½in. long. June. *l.* imbricated, oblong-lanceolate, acute, inflexed-mucronulate, at length somewhat spreading, four to five lines long, scabrous-dotted on the back. Branches slightly pilose, at length glabrous. *h.* 3ft. 1794. An elegant shrub. SYN. *Protea imbricata* (A. B. R. 517).

S. lanatus (woolly). *fl.* purple, plumose-bearded, in heads as large as a hazel-nut; involucre five to seven-leaved, coloured; peduncle short, with or nearly without bracts. August. *l.* imbricated, subulate-linear, four to eight lines long, channelled above, obtusely carinate at back, or rounded, slightly scabrous-dotted, pilose-ciliated. Branches slightly pilose. *h.* 2ft. 1790.

S. setaceus (bristly). *fl.* purple, the claw rather loosely tomentose, the lamina bearded; heads varying in size between a cherry and a plum; spike sessile, ovate. July. *l.* bristly, slender, smooth, 1in. to 1½in. long, mucronate, and, as well as the branchlets, pubescent. Branches straight, slightly tomentose. *h.* 2ft. 1823.

SOROMANES. Included under **Acrostichum** (which *see*).

SOROSE. Heaped, or bearing sori.

SOROSIS. A fleshy mass formed by the consolidation of numerous flowers, seed-vessels and their receptacles: *e.g.*, Bread-fruit, Mulberry, Pineapple.

SORREL (*Rumex*). Two or three species of *Rumex* are cultivated in gardens under the name of Sorrel; the common species (*R. Acetosa*) is a native of Britain. All are hardy perennials. Their leaves are used in salads and culinary preparations, and as a substitute for Spinach. Any kind of Sorrel succeeds best in a rather deep soil and moist situation. Plants may be raised from seeds, sown in drills about 15in. apart, in autumn or spring; or by dividing the rootstocks in March and April. When the

FIG. 502. SORREL.

seedlings are about 3in. high, thin them out to 12in. apart, and keep the ground occasionally hoed between afterwards. A plantation will last three or four years. Some leaves may be gathered for use in about two months from the time of seed-sowing. Besides the common species, *R. Acetosa*—of which there are numerous forms that have received distinctive names, indeed several have been described as species by continental botanists—there is the French Sorrel (*R. scutatus*), which has leaves more acid. This latter is distributed throughout Europe, but is not truly native in Britain; it is, however, naturalised in many places in the British Isles.

SORREL-TREE. *See* **Oxydendron arboreum.**

SORROWFUL-TREE. A common name for *Nyctanthes arbor-tristis.*

SORUS (from *soros*, a heap). The name given to each of the little dark spots so commonly seen on the back of full-grown Fern-fronds (see Figs. 503 and 504), or crowded on specially modified pinnæ (see Fig. 505) or fronds (see Fig. 506). Seen through a lens, these

FIG. 503. PINNA OF POLYPODIUM BRASILIENSE, showing circular Sori without Indusia.

spots prove to be made up of a crowd or heap of small boxes or **Sporangia** (which *see*), each filled with **Spores** (which *see*). The sorus may be bare, as in *Polypodium* (see Fig. 503), or it may be covered with a membrane,

FIG. 504. BACK OF FERTILE FROND OF ASPLENIUM ADIANTUM-NIGRUM, showing Sori with Indusia, fixed by one edge along the side of the Sori.

called the indusium. This covering in some, *e.g.*, *Asplenium* (see Fig. 504) is fixed by one edge along the side of the Sorus; in others *e.g.*, *Aspidium*, it is fixed by the middle, so as to resemble a shield; in others, *e.g.*, *Hymenophyllum* and *Trichomanes*, it forms a cup around the base of the Sorus; and there are many other less important variations in form. The Sori are situated on the veins, or at their ends along the edges of the fronds. Differences in the arrangement of the Sori, and in the structure of the indusia, are much employed in distinguishing the numerous genera of Ferns from one another.

SOUARI NUT-TREE. A name applied to *Caryocar nuciferum*.

SOULANGIA. Included under **Phylica** (which *see*).

SOUR GOURD. A common name for *Adansonia digitata*.

SOUROUBEA. A synonym of **Ruyschia** (which *see*).

SOUR SOP, or **CUSTARD APPLE.** *See* **Anona muricata.**

SOUTH AFRICAN YELLOW WOOD. *See* **Podocarpus elongata.**

FIG. 505. PORTION OF FERTILE FROND OF OSMUNDA REGALIS, showing Sori on modified Pinnæ.

SOUTHERNWOOD (*Artemisia Abrotanum*). A very old inhabitant of nearly every garden. The plant is grown for its medicinal properties, which are somewhat similar to those of Wormwood. Any ordinary garden soil is suitable for its culture. Southernwood may be easily propagated from cuttings, which root very readily in early summer; also by seeds. The latter are very minute.

SOUZA. A synonym of **Sisyrinchium** (which *see*).

SOWBREAD. *See* **Cyclamen.**

SOWERBÆA (named in honour of James Edward Sowerby, 1759-1828, an eminent botanical artist). ORD. *Liliaceæ*. A small genus (three species) of greenhouse, tufted perennials with fibrous roots, limited to Australia. Flowers pink, in a terminal, globular umbel; perianth persistent without twisting, of six oblong or ovate segments, all free, or the inner ones shortly connate at base; stamens three; scapes or stems leafless, simple or rarely branched at the base. Leaves at the base of the stem linear-loriform. Two of the species are grown in this country. They thrive in a mixture of sandy loam and peat. Young plants are easily obtainable by divisions.

S. juncea (Rush-like). *fl.*, perianth segments oval-oblong; umbel many-flowered. May. *l.* at base of stem somewhat distichous.

Sowerbæa—*continued.*

linear-filiform, terete, all short or some nearly as long as the stem, bordered at base and sometimes up to 2in. with scarious, sheathing margins. Stem simple, slender, 1ft. to 2ft. high. 1792. (A. B. R. 81; B. M. 1104; T. L. S. v. 6.)

S. laxiflora (loose-flowered). *fl.*, perianth segments about ¼in. long, much narrower than in *S. juncea*; umbels loose. June. *l.* crowded at the base of the stem, but sometimes extending some way up, the sheath less prominent and not at all scarious. Stems 1ft. to 2ft. high, sometimes slightly branched at the base. 1839. (B. R. 1841, 10.)

SOW THISTLE. *See* **Sonchus.**

FIG. 506. OPHIOGLOSSUM VULGATUM, showing Creeping Rootstock and Barren and Fertile Fronds.

SPADES. These are the most essential of tools in use throughout the whole year in every garden, whether large or small. Although often considered as being a subject of comparatively little importance, digging, or the art of using a Spade, is really quite the reverse. A great difference is noticeable in the way workmen use a Spade. The proper method of doing so is only learned by experience; even amongst several workmen in a garden, one or two may generally be selected who are more to be trusted than any of the others for digging amongst plants, or where it is important to secure an even surface. It is of great advantage when a workman can dig in either direction—that is, use the Spade with either the right or the left hand on top of the handle. Garden ground may require digging to leave the surface even, or, in autumn, it may be advantageous to merely turn and throw it up rough, for exposure to the weather.

Spades—*continued.*

Digging with a Spade is sometimes a dangerous proceeding near the roots of plants; in this case, it is generally preferable to use a fork instead. Spades should always be cleaned after being used, and placed in the tool-shed: it is impossible to work properly with them if they are allowed to get rusty by being left lying about. There are several sizes of Spades made; some, purposely intended for digging drains, have narrow blades, which are rather long in proportion. A medium size, usually known as No. 3, is that most generally useful for digging garden ground. Larger or smaller sizes are sometimes preferred when the soil to be dug is either very light or very heavy.

SPADICEOUS. Bearing, or partaking of the nature of, a Spadix.

FIG. 507. ARUM DRACUNCULUS, showing the Spadix (*s*) projecting from the Spathe (*sp*), which is open above, but remains closed below around the Flowers.

SPADIX (from the Greek *spadix*, a Palm branch bearing fruit). A form of inflorescence, usually having the rachis rather fleshy, with the flowers imbedded in

FIG. 508. ANTHURIUM SCHERZERIANUM MAXIMUM, showing an unbranched Spadix (*s*) lying on an open Spathe (*sp*).

Spadix—*continued.*

pits, less often only sessile on its surface. The inflorescence, before the flowers open, is almost always entirely inclosed in one or more spathes, growing from the peduncle (*e.g.*, *Arum*, see Fig. 507); but in a few Palms (*e.g.*, *Calamus* and its allies) there are numerous spathellæ or small spathes, inclosing only groups of flowers. Rarely (*e.g. Acorus*), the Spadix is not inclosed in either spathes or spathellæ. The Spadix is usually unbranched (*Anthurium*, see Fig. 508, *Calla*, and some Palms), but in the Palms it is frequently branched (*see* **Palmæ**). In the family *Aroideæ* (*Araceæ*), and in most genera of Palms, the flowers on the Spadices are individually male or female, but both sexes may occur on the same Spadix, or may be restricted to separate Spadices, or even to separate plants. In certain Palms, hermaphrodite flowers are produced, sometimes along with male or female flowers. Briefly, a Spadix may be defined as a more or less fleshy spike, usually inclosed, before flowering, in one or more spathes, and bearing unisexual flowers; but no exact definition of the term can be consistently adhered to.

SPADOSTYLES. Included under **Pultenæa** (which *see*).

SPAN. In length, about 9in. The term refers to the space between the tips of the thumb and little finger when spread out.

SPANISH BLUEBELL or SQUILL. *See* **Scilla hispanica.**

SPANISH BROOM. *See* **Spartium junceum.**

SPANISH CHESTNUT. *See* **Castanea sativa.**

SPANISH JUICE PLANT. A common name for *Glycyrrhiza glabra.*

SPANISH OYSTER PLANT. *See* **Scolymus hispanicus.**

SPARAXIS (from *sparasso*, to tear; alluding to the lacerated spathes). ORD. *Irideæ.* A genus comprising (according to the authors of the "Genera Plantarum") five species of pretty, greenhouse, bulbous plants, natives of South Africa. Flowers one to a spathe, sessile, rather large; perianth yellow, with a short tube and six erecto-patent lobes; stamens affixed near the base of the throat; bracts much narrower than the spathe, bidentate; spathes few, scattered, sometimes solitary, broad, scarious, striated or often marked with brown lines, fimbriate-toothed at apex. Leaves few, flat, ensiform or broadly linear, erect or falcate. Stem simple or slightly branched. The best species and varieties are described below. They require precisely similar treatment to that recommended for **Ixia** (to which this genus is allied).

S. bulbifera (bulb-bearing). *fl.* three to five, alternate, distant; perianth yellow, funnel-shaped, the segments ovate-oblong, 1in. long; spathe valves purple-striped at apex; scape simple or branched, leafy, 1ft. to 2ft. high. May. *l.* lanceolate-ensiform, distichous, acute, five lines broad. 1758. SYN. *Ixia bulbifera* (A. B. R. 48; B. M. 545).

S. grandiflora (large-flowered).* *fl.* three to five, alternate; perianth purple, white, or variegated, 2in. long, the segments equal, stellately spreading, oblong-cuneate, rounded at apex; scape simple or dichotomous, terete, leafy, 1ft. to 2ft. high. April. *l.* distichous, lanceolate-ensiform, acute, five lines broad. 1758. (B. M. 779.) SYNS. *Ixia aristata* (A. B. R. 87), *I. grandiflora* (B. M. 541).

S. g. Liliago (Liliago). *fl.*, perianth white, 2in. deep; spathe whitish, sub-diaphanous, equalling the tube. *l.* finely striated, shorter than the stem. (B. R. 258.)

S. g. lineata (red-lined). *fl.*, perianth throat yellow; segments longitudinally marked with a red line, more or less tinged with pink, yellow at base, having a brown mark near the middle, the upper part white; scapes two to four-flowered. *l.* 5in. to 8in. long. (S. B. F. G. ser. ii. 131, under name of *S. lineata.*)

S. g. stellaris (star-like). *fl.*, perianth rich purple, rather paler externally; tube short, filiform, exserted; mouth within of a deeper purple, and surrounded by a broad, irregular, starry, white band. *l.* erect, acute. (S. B. F. G. ser. ii. 383, under name of *S. stellaris.*)

S. pendula (pendulous).* *fl.* lilac, veiny, secund, sessile, within somewhat lacerated spathes; perianth segments oblong, obtuse, spreading; spikes on capillary peduncles, one-sided, six or seven-flowered, pendulous, with two capillary leaves at the base of each peduncle; scapes erect 4ft. high, pendulous at the end, branched. June. *l.* linear, acute, straight, shorter than the scapes. 1825. (B. R. 1360.) This species is now regarded by Mr. Baker as belonging to *Dierama*, and its proper name is *D. pendula.*

S. pulcherrima (very pretty). *fl.* pendulous; perianth dark sanguineous-purple, equal, 1½in. long, campanulate; bracts at the base of the branches 1½in. long; scape attaining 6ft. in its native habitat, the branches remote, capillary, 3in. to 6in. long. October. *l.* narrow-ensiform, rather thick, about ½in. broad, gradually narrowed from below the middle to a very slender apex. 1865. (B. M. 5555; F. d. S. 1810.) *Dierama pulcherrima* is now the correct name of this species.

S. tricolor (three-coloured).* *fl.* three to six, alternate, distant, distichous-spicate; perianth orange, yellow in the throat, the segments oblong, 1in. long, with a triangular, black spot in the middle; spathe valves equal, fuscous-spotted, lacerate-cuspidate; scape 1ft. to 2ft. high, erect, simple, leafy. May. *l.* lanceolate-ensiform, erect, distichous, acute, striated, four lines broad. 1789. (B. M. 1482.) SYN. *Ixia tricolor* (B. M. 381).

S. t. blanda (charming). *fl.*, perianth segments of a whitish ground-colour, flushed with rose, the throat being yellowish. SYN. *S. t. subroseo-albida* (B. M. 1482).

S. t. Griffinii (Griffin's). *fl.*, throat yellow, with a dark blotch between the throat and the violet-purple upper portion of the segments. SYN. *S. t. violaceo-purpurea* (B. M. 1482).

S. t. versicolor (various-coloured). *fl.*, perianth segments bright purple with lighter margins, more or less clouded or diluted, having near the base a dark mark, below which they are bright yellow; spathe striped with brown and purple. (S. B. F. G. 160, under name of *S. versicolor.*)

VARIETIES. The following list comprises the most desirable garden varieties:

ANGELIQUE, white, yellow centre; DELICATA, light yellow, centre spotted brown; GARIBALDI, rich crimson, yellow centre; JOSEPHINE, white, with yellow centre; LADY CAREY, French white, blotched purple; LEOPARD, primrose, yellow centre; MACULATA, white, purple, and primrose; NAIN, white and crimson, primrose centre; TRICOLOR ALBA, white, black, and yellow; TRICOLOR GRANDIFLORA, rich crimson; VICTOR EMMANUEL, red and yellow.

SPARGANIUM (an old Greek name used by Dioscorides, probably for *Butomus*, and derived from *sparganon*, a band; alluding to the form of the leaves). Bur Reed. ORD. *Typhaceæ.* A small genus (less than a dozen species) of marsh or aquatic herbs, inhabiting North temperate regions and Australia. Five species are natives of Britain, but none are of any horticultural value. The stems of *S. ramosum* (Bede Sedge) have been used for making pepper.

FIG. 509. FLOWERING BRANCH OF SPARMANNIA AFRICANA.

SPARMANNIA (named in honour of Dr. Andrew Sparmann, 1748-1820, a Swede, who travelled in South Africa, and afterwards accompanied Captain Cook in his second voyage). ORD. *Tiliaceæ*. A small genus (three species) of softly stellate-pubescent, greenhouse shrubs or trees, natives of tropical or South extra-tropical Africa. Flowers white, with numerous discoloured stamens; sepals and petals four; cymelets terminal, umbelliform; bracts short, involucrate. Leaves cordate, toothed or lobed. *S. africana*, the only species known in cultivation, is a beautiful, quick-growing, arborescent shrub, thriving in a compost of loam and peat. It may be freely increased by cuttings, inserted in sandy peat, under a glass, in heat.

S. africana (African).* African Hemp. *fl.* conspicuous, on elongated, many-flowered peduncles; sepals lanceolate; petals obovate; barren filaments yellow, with purple tips. May. *l.* long-petioled, cordate, acuminate, 5in. to 6in. long, 3in. to 4in. broad, softly hairy on both sides, unequally toothed. Branches terete, patently hairy. *h.* 10ft. to 20ft. South Africa, 1790. See Fig. 509. (B. M. 516.) *S. a. flore-pleno* is a handsome, double-flowered variety.

SPARROW-GRASS. A corruption of *Asparagus*.

SPARROWS. Among gardeners and farmers, Sparrows have long been a bone of contention; but while, a few years ago, the general tendency was to regard them as more useful than harmful, this has, of late years, been changed; and now Sparrows find few to defend them against their many accusers. All are agreed that, at certain seasons, these birds are wholly mischievous. By eating Peas and other seeds in spring, they often ruin the garden produce, or necessitate a second sowing. At a later period, they feed upon the young Peas and other plants, or pick off the buds from Gooseberry-bushes, and other fruit-bearing plants. When seeds are formed, the birds still eat Peas, but chiefly live on the various Cereals (Oats, Wheat, Barley, &c.). It is, however, asserted by the defenders of Sparrows that, in return for these injuries, they do much good by devouring injurious insects and their eggs and larvæ, particularly while there are young birds to be fed in the nests; but examination of the contents of Sparrows' stomachs shows that at no season do insects form more than a very small portion of their food; and that, practically, they do hardly anything to diminish the number of hurtful insects. By far the greater part of their food has been proved to be seeds of Cereals. But not only are Sparrows of little use in destroying hurtful insects; they actually favour the multiplication of the latter in many places, since, by their quarrelsome disposition, they drive away the truly insectivorous birds, whose slender bills and weaker forms do not fit them to fight with Sparrows for their nests. The insectivorous birds must feed on insects or starve; hence they are very useful, and they cannot injure the produce of a garden. Therefore, to have them driven away is a serious evil. Swallows and window martins are peculiarly liable to be ousted by Sparrows. Where the last-named have been kept down, it has been observed that the swallows and martins soon become more numerous, and insects cease to be troublesome. The results of inquiries in America and in Australia quite agree with the above statements; and a war of extermination has been strongly urged, though, of late, the hostility to them has been lessened in New York as they have developed a taste for *Cicada septem-decim*. In England, strenuous efforts are now made in many districts to limit the number of Sparrows, by shooting the birds, and by removing the nests and eggs wherever accessible. These measures can be persevered in by owners and occupiers of land, and by those whom they authorise, even during the "close time," *i.e.*, from 1st March to 1st August, without infringing the Wild Birds Protection Acts, 1880, 1881.

For fuller information, the reader is referred to a work entitled "The House Sparrow and the English Sparrow in America," by Messrs. Gurney, Russell, and others, 1885.

SPARTIANTHUS. A synonym of **Spartium** (which *see*).

SPARTINA (from *spartine*, a cord; alluding to the use of the foliage). SYNS. *Limnetis*, *Ponceletia*, *Solenachne*, *Trachynotia*. ORD. *Gramineæ*. A genus comprising six or seven species of stove, greenhouse, or hardy, maritime grasses; two are broadly dispersed over the shores of Europe, America, and Africa, two or three are North American, one is a native of extra-tropical South America, and one is found in Tristan d'Acunha and Amsterdam Island. Spikelets one-flowered; spikes at the sides of a terminal, erect peduncle, sometimes clustered in a long and dense, spike-like panicle, sometimes narrow and scattered. Leaves convolute-terete or esplanate at base. The genus, which is represented in Britain by *S. alternifolia*, *S. stricta* (Cord Grass; Mat Weed, &c.), and *S. Townsendi*, has no horticultural merit.

SPARTIUM (the old Greek name used by Dioscorides, and derived from *sparton*, cordage; the twigs of the plant, by maceration, produce a good fibre, which is sometimes made into thread). SYN. *Spartianthus*. ORD. *Leguminosæ*. A monotypic genus. The species is a hardy, deciduous shrub, with Rush-like and often leafless branches. It is a very ornamental plant when in blossom, and consequently is well adapted for shrubberies. Any ordinary soil is suitable. Propagation is usually effected by seeds, which ripen in abundance. Young cuttings will root, if covered with a hand glass.

S. junceum (Rush-like).* Rush or Spanish Broom. *fl.* yellow, fragrant, showy, disposed in terminal racemes; calyx somewhat spathaceous; standard ample; wings obovate; keel incurved, acuminate; bracts and bracteoles minute, highly caducous. July to September. *l.* rare, one-foliolate; stipules wanting. *h.* 6ft. to 10ft. Mediterranean region and Canary Isles, 1548. (B. M. 85; S. F. G. 671; B. R. 1974, under name of *S. acutifolium*.) There is a double form in cultivation.

SPARTOTHAMNUS (from *sparton*, cordage, and *thamnos*, a branch; alluding to the use of the plant). ORD. *Verbenaceæ*. A monotypic genus. The species is a pretty, glabrous or pubescent, evergreen shrub or subshrub. It requires the temperature of a cool, airy greenhouse. A compost of sandy peat and loam is most suitable for its culture. Propagated by cuttings, inserted in sand, under a glass.

S. junceus (Rush-like). *fl.* white, very small, solitary in the axils, with small bracteoles; calyx and corolla five-lobed. August. *l.* small and distant, often reduced to small scales, all opposite; when fully developed ½in. to ¼in. long, lanceolate or ovate-lanceolate. Branches divaricate, acutely four-angled, Broom-like and appearing almost leafless. *h.* 2ft. Australia, 1819.

SPATALANTHUS. Included under **Romulea** (which *see*).

SPATALLA (from *spatalos*, delicate; in allusion to the nature of the flowers). ORD. *Proteaceæ*. Of this genus seventeen species have been described; they are greenhouse, Heath-like shrubs, restricted to South Africa. Flowers rather small, solitary under the bracts, capitate, sessile or shortly pedicellate, forming a loose spike or terminal raceme; perianth slender, scarcely dilated towards the base, the limb straight or incurved, ovoid or oblong; hypogynous scales four, subulate. Nuts often pubescent or villous. Leaves scattered, filiform or subulate, undivided. A selection of the species known to cultivation is here given. They all have purple flowers and require similar treatment to **Protea** (which *see*).

S. incurva (incurved). *fl.*, involucre three or four-flowered, pubescent, four-leaved; racemes solitary or often aggregate, pedunculate, 1in. to 2in. long. May. *l.* rather loosely spreading, ½in. to 1in. long, incurved, slender, bristly-mucronate, scarcely attenuated at base, glabrous; young ones, and branchlets, slightly pilose. *h.* 2ft. 1789.

S. mollis (soft). *fl.*, involucre villous, two-leaved; spike solitary, sessile, erect, dense, oblong-cylindrical, branched, scarcely 1in. long. June. *l.* erecto-patent, seven to eight lines long, straight, and, as well as the slender branchlets, silky-villous. *h.* 2ft. 1826.

S. nivea (snowy). *fl.*, involucre campanulate, one-third the length of the perianth; spike sub-sessile, erect, dense, imbricated, 1in.

Spatalla—*continued.*

to 1½in. long. June. *l.* imbricated, eight to ten lines long, slender, acute, straight or slightly curved; younger ones (and branches) slightly silky-pilose. *h.* 2ft. 1806.

S. pedunculata (long-peduncled). *fl.*, claw tomentose; involucre sub-campanulate, bilabiate, cano-tomentose, at length glabrescent; spike solitary, 1in. to 2in. long, at length rather loose; peduncle 1in. to 1½in. long, with a few adpressed, carinate-subulate bracts. April. *l.* much incurved, nearly 1in. long, triquetrous-filiform, rather obtuse, much attenuated at base, incurved-falcate above; young ones straight, slightly silky-pilose. *h.* 2ft. 1822.

S. prolifera (proliferous). *fl.*, involucre sub-sessile, four-leaved; spikes sessile, conico-capitate, leafy-bracted. July. *l.* erect, or at length spreading, clustered, imbricated, five to eight lines long, slender, straight or scarcely incurved, setaceous-mucronulate; younger ones (and branchlets) silky. Branches reddish, nearly glabrous. *h.* 2ft. 1800.

S. pyramidalis (pyramidal). *fl.* yellowish-pubescent; involucre shortly pedicellate, pubescent, four-leaved; spike 1in. to 1½in. long, solitary, sessile, erect, oblong-pyramidal, dense, sometimes branched at the base. June. *l.* much crowded, erecto-patent, six to ten lines long, slender, very acute, straight, at length slightly recurved, slightly pilose. Branchlets umbellate. *h.* 3ft. 1821.

SPATHACEOUS. Bearing, or having the nature of, a spathe.

SPATHANTHEUM (from *spathe*, a spathe, and *anthos*, a flower; the flowers are seated on the midrib of the spathe). Including *Gamochlamys*. ORD. *Aroideæ* (*Araceæ*). A small genus (two species) of stove, tuberous-rooted perennials; one is found in Bolivia, and the other is a native of Africa. Flowers spread over the whole length of an inappendiculate, semi-cylindrical spadix, adnate to, and shorter than, the spathe, monœcious, all perfect; spathe oblong-lanceolate, acuminate, membranous, at length opening, longitudinally nerved and reticulated, persistent; peduncle slender, nearly equalling the leaves. Leaves on long and slender petioles, cordate or sagittate-ovate, entire or pinnatifid-lobed. *S. heterandrum* (the only species in cultivation) thrives in a well-drained soil, composed of rich loam and peat. Plenty of water is necessary during the growing season. Propagation may be effected by offsets, or by division of the tubers.

S. heterandrum (various-anthered). *fl.*, spathe green, fleshy, boat-shaped, acute, 4in. to 5in. long; spadix half as long as the spathe, adnate through its whole length; peduncle rather shorter than the petiole, firm, erect, sub-terete. *l.* cordate-ovate, bright green, glabrous, rather fleshy, 1ft. long, deeply pinnatifid, the divisions acute; petioles 2ft. long. Rootstock bearing a solitary leaf. Africa, 1876. SYN. *Gamochlamys heterandra.*

SPATHE (from *spathe*, a broad blade; in allusion to its form in most Palm-trees). A large bract, situated on the flower-stalk below the inflorescence, and surrounding the latter until the flowers are ready to open. There may be only one bract for each inflorescence (*e.g.*, *Narcissus*, *Arum*, &c.); but often (in many Palms) there are two or more, the outer ones being smaller and open at the top, and hence called incomplete. Spathes vary in texture, from membranous (*Narcissus*) to leafy (*Arum*, see Fig. 507, page 463), or fleshy, or woody, as in many of the larger Palms (*Cocos*, *Maximiliana*, &c.), in which the part that incloses the flowers may reach a length of over 3ft., and a thickness of over ½in.

SPATHEGASTER. A group of Gall-flies, that form galls on Oak. Most conspicuous of these is the Currant Gall, so common in the early summer on the male catkins, and on leaves, of the common Oak, throughout Britain. The experiments of Dr. Adler, and of other entomologists, have, of late years, given grounds for the belief that the insects originally grouped in the genus *Spathegaster*, are only stages in the development of what were formerly regarded as distinct species of a different genus, *Neuroterus*, which make galls in autumn, very different from those of *Spathegaster* in appearance. For an account of what are now believed to be the relations between the insects and galls, *see* **Oak Galls.**

SPATHELIA (from *spathe*, a Palm-tree; alluding to the similarity of habit). ORD. *Simarubeæ*. A genus comprising only three species of tall and showy, stove, evergreen trees, with simple trunks, inhabiting the West Indies. Flowers rather large, shortly pedicellate, disposed in ample, terminal, elongated, branched panicles, the ultimate branchlets of which are sub-cymose; calyx five-parted; petals five, scarcely longer than the calyx, imbricated; stamens five. Leaves alternate, imparipinnate, many-jugate; leaflets alternate, linear-oblong or sickle-shaped, sub-entire or serrated, the margins gland-bearing. *S. simplex*, the only species introduced to cultivation, thrives in a compost of loam and peat; it may be increased by ripened cuttings, inserted in sand, under a glass, in heat.

S. simplex (simple). May Pole, Mountain Green, or Mountain Pride of the West Indies. *fl.* red; panicle powdery, spreading, several feet long. April. *l.* twenty to forty-jugate, puberulous and glabrate beneath, oblong-lanceolate or linear-lanceolate, acuminate, or falcate, crenate or quite entire; leaflets very variable, opposite or alternate, sessile or petiolulate, crenated or entire. Stem slender, resembling that of a palm, 20ft. to 50ft. high. 1778. (B. R. 670.)

SPATHELLA (a diminutive of *spathe*). The name given to the numerous small bracts that, on the spadices of *Calamus*, and allied genera of Palms, replace the one or few large spathes met with among the other Palms.

SPATHICARPA (from *spathe*, a spathe, and *karpos*, fruit; the ovaries are seated along the midrib of the spathe). ORD. *Aroideæ* (*Araceæ*). This genus embraces eight species of stove, evergreen, tuberous-rooted herbs, natives of Brazil and Paraguay. Flowers all perfect, the males and females longitudinally disposed in a few series, along the semi-cylindrical, inappendiculate spadix; spathe oblong-lanceolate, acuminate, membranous, at length opening, convolute at base and apex, persistent; peduncles slender, exceeding the leaves. Leaves membranous, lanceolate, or hastate- or sagittate-cordate, or hastately trisected; petioles elongated, long-sheathing. Only a couple of the species have been introduced. These thrive in rich, sandy loam; they may be multiplied by divisions, or by seeds.

S. hastifolia (hastate-leaved). *fl.*, spathe greenish, elegantly acuminate; spadix elongated. *l.* tripartite; middle part oblong-ovate, acuminate; lateral ones oblong or ovate-lanceolate, slightly acute; petioles twice or thrice as long as the blades. *h.* 1ft. Minas Geraes.

S. longicuspis (long-cuspidate). A synonym of *S. sagittifolia.*

S. sagittifolia (sagittate-leaved). *fl.*, spathe green, long-decurrent at base, long or rarely short-cuspidate; spadix slender, scarcely shorter than the spathe. *l.* sagittate; anterior lobe ovate-lanceolate, slightly elongated; posterior lobe retrorse, spreading, obtuse; petioles nearly twice as long as the blades. *h.* 6in. to 12in. Bahia, 1860. SYN. *S. longicuspis.*

S. s. platyspatha (broad-spathed). *fl.*, spathe dilated towards the apex, shortly cuspidate. *l.* sagittate, deeply cordate at base.

SPATHIPHYLLUM (from *spathe*, a spathe, and *phyllon*, a leaf; alluding to the leaf-like spathe). Including *Amomophyllum* and *Massovia*. ORD. *Aroideæ* (*Araceæ*). A genus embracing about twenty tropical American, and two Malayan, species of almost stemless, stove, evergreen, perennial herbs. Flowers all fertile, dense; spathe leaf-like, membranous, oblong or lanceolate, acute, acuminate, or caudate-acuminate, at length broadly expanded, accrescent and persistent; spadix shorter than the spathe, sessile or stipitate, the stalk sometimes adnate to the spathe, cylindrical. Leaves oblong or lanceolate, acuminate or cuspidate; petioles elongated, long-sheathing, usually geniculate at apex. Several of the species have been introduced, and are here described. Equal parts of leaf mould and peat, mixed with a little loam and small pieces of charcoal, form a suitable compost for Spathiphyllums. They require a moist atmosphere and an abundance of water. Propagation is sometimes effected by seeds, sown on a hotbed, but chiefly by divisions of the rootstock. "For decorative purposes, some of the smaller species, such as *S. candidum*,

Spathiphyllum—*continued.*

S. cannæfolium, *S. floribundum*, and *S. Patini*, are very useful, and form a very effective contrast with *Anthurium Andreanum* and *A. Scherzerianum*" (N. E. Brown).

S. candidum (white).* *fl.*, spathe pure white, ovate, acuminate, about 3½in. in length; spadix white, slender, straight, cylindrical; flowering peduncle often knee-jointed just below the spathe. *l.* ovate-lanceolate, attenuately acuminate, 6in. to 8in. long, on slender, erect petioles. *h.* 9in. Columbia, 1875. Closely allied to *S. Patini.* SYN. *Anthurium candidum.*

S. cannæfolium (Canna-leaved).* *fl.*, spathe white, lanceolate- or elliptic-oblong, sub-sessile, scarcely decurrent, shortly cuspidate, 6in. long, 2in. broad; spadix white, 5in. long, 3in. broad. *l.* ovate- or elliptic-oblong, shortly acuminate; petioles equalling or exceeding the blades, sheathed scarcely to the middle. *h.* 1ft. Venezuela, Guiana, and Brazil. (R. G. 640.) SYNS. *S. cannæforme, Anthurium Dechardi* (I. H. 269), *Pothos cannæfolia* (B. M. 603; L. B. C. 471).

S. cannæforme (Canna-like). A synonym of *S. cannæfolium.*

S. cochlearispathum (spoon-spathed). *fl.*, spathe green, 1ft. long, ovate or oblong-ovate, produced into a long-cuspidate point; spadix whitish. *l.* broadly oblong, undulated, upwards of 3ft. long and 1ft. wide, rounded or sub-cordate at base, lustrous-green; petioles nearly equalling the blades. *h.* 4ft. Mexico, 1875. SYN. *S. heliconiæfolium* (I. H. 189).

S. commutatum (changed). *fl.*, spathe white, oblong-lanceolate, nearly flat, cuspidate; spadix white, short, oblong; peduncles tall, shortly decurrent. *l.* ovate-oblong, deep green; petioles shorter than the blades. *h.* 2½ft. Philippines, 1870. A rather elegant plant, rivalling in beauty the well-known African or Trumpet Lily. (R. G. 637, f. 1-3, under name of *S. Minahassæ.*)

S. floribundum (bundle-flowered). *fl.*, spathe ivory-white, 2in. long, oblong-lanceolate, with an elongate-cuspidate acumen; spadix white, stipitate, scarcely shorter than the spathe; peduncles much exceeding the petioles. *l.* oblong-elliptic or oblong-lanceolate, acuminate and very acute, inequilateral, paler beneath; peduncles nearly equalling the blades. *h.* 1ft. New Grenada, 1874. (I. H. 159, under name of *Anthurium floribundum.*)

S. heliconiæfolium (Heliconia-leaved). A synonym of *S. cochlearispathum.*

S. hybridum (hybrid). A garden hybrid between *S. cannæfolium* and *S. Patini*, and quite intermediate in character. The spathe is as large as in the first-named parent, and whiter on both sides. (B. H. 1885, p. 89; G. C. xix. p. 500; I. H. 450.)

S. Ortgiesii (Ortgies'). *fl.*, spathe bright green, oblong-elliptic; spadix white, oblong, the stalk connate with the base of the midrib. *l.* broadly elliptic or elliptic-oblong, undulated; petioles broadly winged. *h.* 1½ft. Mexico, 1873. (R. G. 738.)

S. Patini (Patin's). *fl.*, spathe whitish, except the green midrib, oblong-lanceolate, very long-acuminate, spreading or reflexed; spadix whitish, straight, obtuse, rather long-stipitate, a little shorter than the spathe; peduncles equalling or exceeding the leaves. *l.* elongate-lanceolate, long-narrowed to both ends, very acute, deflexed, inequilateral, pale green; petioles twice as long as the blades, erect, slender, terete. *h.* 9in. New Grenada, 1874. (I. H. 397.) SYNS. *Amomophyllum Patini, Anthurium Patini* (G. C. n. s., iii. p. 525).

S. pictum (painted).* *l.* somewhat fleshy, broadly ovate-elliptic, 1½ft. or more long, glossy dark green, mottled along the course of the transverse veins, with blotches of golden-green. South America, 1874. An ornamental plant, in habit resembling a Dieffenbachia. The proper name of this plant is *Rhodospatha picta.*

S. Wallisii (Wallis'). *fl.* spathe of a pleasing green, 5½in. long, oblong-elliptic, rounded and decurrent at base, long-cuspidate at apex; spadix cylindrical, one-third the length of the spathe. *l.* 6in. to 9in. long, oblong-lanceolate, rounded or cuneate at base, cuspidate at apex, the margins slightly crenate-crisped; petioles 5in. to 8in. long. New Grenada. (R. G. 920.)

SPATHIUM (of Edgworth). A synonym of *Aponogeton.*

SPATHIUM (of Loureiro). A synonym of **Saururus** (which *see*).

SPATHODEA (from *spathe*, a spathe; referring to the form of the calyx). ORD. *Bignoniaceæ.* A monotypic (?) genus. *S. campanulata* is a noble, stove, evergreen tree, requiring culture similar to **Bignonia** (which *see*). *See also* **Newbouldia.**

S. campanulata (bell-shaped). *fl.* orange, in a short, terminal, slightly-branched raceme; calyx long, spathe-like, densely tomentose; corolla campanulate, 3in. long, 2½in. in diameter, with a sub-bilabiate limb of five broad lobes. June. *l.* ample, pinnate; leaflets lanceolate, petiolulate, entire. *h.* 50ft. Tropical Africa, 1858. (B. M. 5091; F. d. S. 830; L. & P. F. G. 104; L. J. F. 388.)

S. lævis (smooth-leaved). A synonym of *Newbouldia lævis.*

SPATHOGLOTTIS (from *spathe*, a spathe, and *glottis*, a tongue; in allusion to the form of the lip). Including *Paxtonia.* ORD. *Orchideæ.* A genus comprising about ten species of mostly stove, terrestrial orchids, natives of the East Indies, South China, the Malayan Archipelago, the Pacific Islands, and Australia. Sepals free, sub-equal, spreading; petals similar, sometimes broader or longer; lip sessile at the base of the column, concave or saccate at base, deeply three-lobed, the middle lobe contracted at the base, and bearing prominent tubercles or calli; pollen masses eight, of which four are usually smaller; bracts erect or deflexed; racemes on erect scapes, leafless, except sheathing scales. Leaves on the caudex solitary or twin, elongated; petioles at length more or less thickened into pseudo-bulbs or tubers. The best-known species are here described. They require similar treatment to **Bletia** (which *see*).

S. aurea (golden). *fl.* golden-yellow, marked on the lip with a few dark blood-coloured spots, large, about six borne at the very end of the scape. July. *l.* narrow, resembling those of a Phaius. *h.* 2ft. Malacca, 1849. A rather handsome species.

S. Fortunei (Fortune's).* *fl.* yellow; sepals ovate, obtuse; petals broader, oblong, sub-sessile; lateral segments of lip blotched with red, oblong, erect, the middle one cuneate and emarginate; column remarkably long and narrow; raceme secund, pubescent; bracts acuminate. January. *l.* twin, lanceolate-linear, longer than the pubescent scape. Hong Kong. Greenhouse. (B. R. 1845, 19.)

S. Lobbii (Lobb's). *fl.* sulphur-yellow, about 1in. in diameter, long-stalked; lateral sepals streaked with three or four brown lines; petals broader than the sepals; raceme loose; scape slender, firm, loosely hairy. Burmah, 1876. (G. C. n. s., xviii. p. 532.)

S. pacifica (Pacific). *fl.*, sepals and petals whitish-lilac, with darker markings; lip lilac, edged with yellow, the two side lobes blunt, curved; front lobe stalked, reniform, undulated, with an orange disk, the stalk having two white tubercles on its base. *l.* oblong-lanceolate. Pseudo-bulbs conical. Pacific Islands, 1883.

S. Petri (Peter Veitch's).* *fl.*, sepals ligulate, acute, and, as well as the much broader petals, dark lilac in colour; lip trifid, purple, with a white disk and a rhomboid callosity, having three furrows and two lines of long hairs between the side lobes, ochre-yellow; bracts large and conspicuous; scape 2ft. long, green, becoming purplish at the top. *h.* 2ft. South Sea Islands, 1877. An interesting plant. (B. M. 6354.)

S. plicata (folded). *fl.* purple; sepals spreading; petals obtuse, connivent; lateral segments of lip truncate, cuneate-oblong, the middle one clawed, with two tubercles at base; bracts petaloid, lanceolate, coloured; scape sometimes 2ft. high and many-flowered, sometimes 1½ft. high and two-flowered. June. *l.* many, ensiform, plicate. Java, &c., 1844.

S. pubescens (downy). *fl.* dirty-yellow, slightly violet at the base of the lip; sepals acute; petals obtuse; lateral lobes of lip erect, the middle one three-keeled, with two tubercles at base; raceme two to eight-flowered, secund; scape ascending, pubescent, 1½ft. long. June. *l.* twin, linear-lanceolate, acuminate at both ends, shorter than the scape. Tubers as large as hazel nuts. Sylhet.

S. rosea (rose-coloured).* *fl.* rose-coloured, pretty, about 1½in. across; sepals and petals oblong, acute; bracts spreading, as long as the pedicels; scape erect, slender, distantly sheathed, taller than the leaves. July. *l.* lanceolate, plicate, narrowed at base, nearly 2ft. long. Pseudo-bulbs densely aggregated, three-leaved. Philippines, 1837. SYN. *Paxtonia rosea.* (B. R. 1838, 60.)

S. tomentosa (tomentose). *fl.* crimson; sepals and petals very obtuse; lateral segments of the lip erect, truncate; middle one reniform at apex, the claw elongated; raceme twenty-flowered; bracts and scape coated with a close fur. June. *l.* twin, broadly lanceolate, longer than the scape. Manilla.

SPATHOTECOMA. A synonym of **Newbouldia** (which *see*).

FIG. 510. SPATHULATE AND APICULATE LEAF.

SPATHULATE, SPATULATE. Oblong, with the lower end attenuated; shaped like a druggist's spatula. A Spathulate and apiculate leaf is shown at Fig. 510.

SPATHYEMA. A synonym of **Symplocarpus** (which *see*).

SPATULARIA (of Haworth). Included under **Saxifraga** (which *see*).

SPAWN, MUSHROOM. The underground, vegetating part of the plants of which Mushrooms are the parts devoted to the reproduction of the species. It consists of white threads of mycelium growing among masses of decaying animal or plant remains; *e.g.*, in old hotbeds, in stable-yard manure, in droppings of horses or cattle, &c. In artificially-prepared Spawn, the mycelium grows in firm and brick-shaped, or loose, masses of the food (dung, &c.), penetrating into all parts of these, and filling them with the white cells of which it is composed. If kept dry, Mushroom Spawn will remain unchanged for years; but, when a piece of it is placed in a moist bed of manure, or other suitable food, at a temperature of about 60deg. Fahr., growth goes on vigorously. The new food is traversed by mycelium, and, in a short time, Mushrooms begin to grow upon the surface of the bed. Thus the Spawn does not correspond to seed, but rather may be compared, in its mode of reproducing the species, with the tubers, or so-called *seed*, of potatoes. For the mode of preparing and using Spawn in the artificial cultivation of Mushrooms, *see* **Mushrooms.**

SPEARMINT. *See* **Mentha viridis** and **Mint.**

SPEARWORT. A name applied to several species of *Ranunculus.*

SPECIES. "A Species comprises all the individual plants which resemble each other sufficiently to make us conclude that they are all, or may have been all, descended from a common parent. These individuals may often differ from each other in many striking particulars, such as the colour of the flower, size of the leaf, &c., but these particulars are such as experience teaches us are liable to vary in the seedlings raised from one individual" (Bentham).

SPECKLINIA. Included under **Pleurothallis** (which *see*).

SPECULARIA (from *Speculum Veneris*, Venus' Looking-glass, the early name of the common European species). SYNS. *Apenula, Legouzia, Prismatocarpus* (in part). ORD. *Campanulaceæ.* A genus comprising about eight species of hardy, erect or decumbent, hispid or glabrous herbs, natives of the Northern hemisphere, one being also found in South America. Flowers sessile or shortly pedunculate in the axils, bibracteate, the upper ones panicled; calyx five-parted; corolla blue, violet, or white, sub-rotate or broadly campanulate, five-lobed; stamens free of the corolla, the filaments flat. Leaves alternate, entire or toothed. The genus is represented in Britain by *S. hybrida.* For culture of the four species described below, *see* **Campanula.**

S. hybrida (hybid). Corn Violet. *fl.* sub-sessile; calyx longer than the floral leaves, shortly angled; corolla blue within, lilac outside, cleft to near the middle. June to September. *l.* small, oblong, waved; radical ones on broad petioles, ovate or spathulate; cauline ones sessile. Stem 6in. to 10in. long, erect or decumbent. Europe (Britain), &c. (Sy. En. B. 874, under name of *Campanula hybrida.*)

S. pentagonia (five-angled). *fl.* blue; calyx shorter than, or as long as, the corolla, with spreading lobes. July. *l.*, lower ones obovate, entire; the others ovate-oblong or lanceolate, nearly entire. Stem branched. *h.* 1ft. Levant, 1686. (B. R. 56, under name of *Campanula pentagonia.*)

S. perfoliata (perfoliate). Venus' Looking-glass of North America. *fl.* sessile, solitary or two or three together; the upper or later ones only with a conspicuous purplish-blue corolla. May to August. *l.* roundish or ovate, clasping by the heart-shaped base, toothed. *h.* 3in. to 20in. North America, 1680.

S. Speculum. Speculum Veneris; Common Venus' Looking-glass. *fl.* purple; calyx glabrous or pubescent, as long as the corolla, the lobes at length reflexed. July. *l.* similar to those of *S. pentagonia.* Stem branched; branches three-flowered. *h.* 1ft. Europe, 1596. (B. M. 102 and S. F. G. 216, under name of *Campanula Speculum.*)

SPEEDWELL. *See* **Veronica.**

SPEIRANTHA (from *speira*, a coil, and *anthos*, a flower; in reference to the inflorescence). ORD. *Liliaceæ.* A monotypic genus. The species is a highly glabrous, stemless, greenhouse plant, with an oblique, thick, stoloniferous rhizome. It was formerly classed under **Albuca** (which *see* for culture).

S. convallarioides (Convallaria-like). *fl.*, perianth white or greenish, about ¼in. long, six-parted; stamens six; racemes twenty to thirty-flowered, 1in. to 2in. long; scape slender, 3in. to 4in. long. June. *l.* six to eight in a rosette, sub-erect, oblanceolate, sessile, 5in. to 6in. long, 1in. to 1½in. broad, acute. China, 1854. SYN. *Albuca Gardeni* (B. M. 4842).

SPELT. *See* **Triticum Spelta.**

SPERAGE. An old name for *Asparagus.*

SPERGULA PILIFERA. A synonym of *Sagina pilifera.*

SPERLINGIA. A synonym of **Hoya** (which *see*).

SPERMACOCE (from *sperma*, a seed, and *akoke*, a point; probably alluding to the pointed calyx teeth on the fruit). Button Weed. Including *Bigelovia* (of Sprengel). ORD. *Rubiaceæ.* A large genus (about 150 species) of stove, greenhouse, or hardy, low, annual or perennial herbs or sub-shrubs, scattered over tropical and subtropical regions. Flowers white, pink, or blue, small or minute, sessile, solitary and axillary, or in fascicles, cymes, heads, or whorls. Leaves opposite, sessile or stalked, membranous or coriaceous. The species, several of which have been introduced, have little horticultural value. **Borreria** (which *see*) is included here by the authors of the "Genera Plantarum."

SPERMADICTYON. A synonym of **Hamiltonia** (which *see*).

SPERMAXYRUM. A synonym of **Olax** (which *see*).

SPERMUM. This term, used in Greek compounds, denotes a seed or any seed-like part, *e.g.*, Macrospermum, large-seeded; Polyspermum, many-seeded.

SPHACELE (from *Sphakos*, the Greek name of Sage, which these plants resemble in foliage). SYN. *Phytoxis* (of Sprengel). ORD. *Labiatæ.* A genus of about twenty species of stove or greenhouse shrubs or sub-shrubs; one is a native of the Sandwich Islands, and the rest are mostly Western American, extending from Brazil and Chili to California. Flowers red, violet, blue, or whitish; calyx five-toothed; corolla tube ample; limb short, scarcely bilabiate, four-cleft, with broad, erecto-patent lobes; stamens four; whorls loosely two to six-flowered, or densely six to many-flowered, racemose or spicate. Nutlets ovoid, smooth. Leaves often bullate-wrinkled, and canescent beneath; floral ones reduced to bracts. Three species have been introduced, all requiring greenhouse heat. For culture, *see* that advised for the tender species of **Salvia.**

S. cærulea (blue). *fl.* pale lavender-blue, disposed in numerous spikes. *l.* ovate, serrated. 1866. A soft-wooded, winter-blossoming sub-shrub. (F. M. 281.)

S. campanulata (bell-shaped). *fl.*, calyx four lines long; corolla pale bluish, nearly eight lines long, with broad, crenulated lobes; whorls two-flowered; racemes loose, secund. July. *l.* shortly petiolate, oblong-lanceolate, ½in. to nearly 1in. long, narrowed at base; uppermost ones much wrinkled. *h.* 2ft. to 3ft. Chili, 1795. Shrub. (B. R. 1382.)

S. Lindleyi (Lindley's). *fl.*, corolla purplish-violet, twice as long as the calyx, pubescent outside, slightly incurved; whorls many-flowered; raceme simple, dense. July. *l.* ovate, 1½in. to 3in. long, cordate at base, much bullate-wrinkled, white-woolly beneath. *h.* 3ft. to 4ft. Chili, 1825. Shrub. (B. M. 2993.) SYN. *Stachys Salviæ* (B. R. 1226).

SPHÆRALCEA (from *sphaira*, a globe, and *Alcea*, Marsh Mallow; the carpels are disposed in a round head). Globe Mallow. SYNS. *Phymosia, Sphæroma.* ORD. *Malvaceæ.* A genus comprising about twenty-five species of ornamental, stove, greenhouse, or hardy herbs, sub-shrubs,

Sphæralcea—*continued.*

or shrubs, in habit resembling *Malva* or *Malvastrum*; four are natives of the Cape of Good Hope, and the rest inhabit the warmer regions of America. Flowers violet (rarely red) or flesh-coloured, shortly pedicellate (rarely long-pedunculate), solitary or fascicled, axillary, or disposed in terminal racemes or spikes; calyx five-cleft; staminal column more or less divided near the summit into numerous filaments; bracteoles three, free or coalescing at base. Leaves generally angled or lobed. The species described below thrive in a rich, well-drained, loamy soil, and like a light, airy place near the glass. They are readily increased by cuttings of the young growths, inserted in sandy soil, under a bell glass, and kept shaded until rooted.

S. abutiloides (Abutilon-like). *fl.* rose-coloured; calyx twice exceeded by the petals; peduncles axillary, one to five-flowered. August. *l.* roundish, angular-lobed, serrated. *h.* 4ft. Bahamas, 1725. Greenhouse shrub. (B. M. 2544, under name of *Malva abutiloides.*)

S. acerifolia (Maple-leaved). *fl.* pink; peduncles aggregated, terminal. July. *l.* five-lobed, sub-cordate; lobes acute, dentate or unequally serrate. *h.* 4ft. North-west America, 1861. A half-hardy, stellate-pubescent shrub. (B. M. 5404.)

S. angustifolia (narrow-leaved). *fl.* pink; peduncles axillary, solitary or in pairs, one or few-flowered; involucral leaflets bristly, deciduous. August and September. *l.* lanceolate, toothed, powdery. *h.* 3ft. to 4ft. Mexico, 1780. Greenhouse shrub. (B. M. 2839, under name of *Malva angustifolia.*)

S. elegans (elegant).* *fl.* pale, with dark purple veins, from the axils of the upper leaves, usually on short, simple stalks. July. *l.* rather distant, deeply three-lobed or three-parted, on petioles of their own length; lobes cuneate, inciso-pinnatifid, undulated, stellate-tomentose, bluntly toothed. Stems numerous, procumbent or spreading, 2ft. or more long. South Africa, 1791. Greenhouse sub-shrub.

S. miniata (vermilion).* *fl.* vermilion; peduncles axillary, racemose, few-flowered, but sometimes only one-flowered. May to July. *l.* ovate, three-lobed, toothed, tomentose. Stems erect. *h.* 1ft. South America, 1798. Greenhouse sub-shrub. (B. M. 5938; S. B. F. G. ser. ii. 120.)

S. nutans (nodding). *fl.* reddish-purple, nodding; peduncles axillary, usually three-flowered, exceeding the leaves; involucral bracts subulate. July. *l.* cordate, five-lobed, unequally crenate-toothed, stellate-tomentose; lobes very acute; stipules filiform. Stem branched. *h.* 2ft. Guatemala (?), 1852. Stove shrub. (F. d. S. 726; L. & P. F. G. iii. p. 173.)

S. obtusiloba (obtusely-lobed). *fl.* crowded; petals purple, obcordate, with rather dark claws; involucre of three linear leaflets; peduncles axillary and terminal, corymbosely racemose, many-flowered. July. *l.* cordate, somewhat five-lobed, crenate; lobes very blunt. *h.* 3ft to 4ft. Chili, 1827. A stellate-tomentose, greenhouse shrub. (B. M. 2787, under name of *Malva obtusiloba.*)

S. umbellata (umbellate). *fl.* of a fiery-violet colour, large; involucral leaflets obovate, somewhat stipitate, deciduous; peduncles axillary, umbelliferous. January to April. *l.* subpeltate, five-lobed, obtuse. *h.* 10ft. Mexico, 1814. Stove shrub. (L. B. C. 222; B. R. 1608, under name of *Malva umbellata.*)

SPHÆRENCHYMA. Spheroidal or spherical, cellular tissue, such as is found in the pulp of fruits.

SPHÆRIACEÆ. A large family of Fungi, belonging to the division of **Pyrenomycetes** (which *see*), provided with perithecia, of leathery or carbonaceous texture, distinct from the stroma, or mycelium, which open by a round hole or pore, sometimes in the wall of the perithecium, but sometimes at the end of a long neck. In this group are various species hurtful to cultivated plants (*see* **Pleospora**). Several of them show pleomorphism very clearly. Formerly, the family was held to include certain other smaller groups that are now regarded as families distinct from it (*e.g., Dothidiaceæ*, with fleshy, and often bright-coloured, perithecia), to which belong various species (*e.g., Polystigma rubrum* on Plum-leaves) that destroy living plants. The spores and sporidia in *Sphæriaceæ* vary greatly in different genera in complexity of structure, and in the modes of production.

SPHÆROCARPUS. A synonym of *Globba.*

SPHÆROCARYA. A synonym of **Pyrularia** (which *see*).

SPHÆROCHLOA. A synonym of *Eriocaulon.*

SPHÆROCIONIUM. Included under *Hymenophyllum.*

SPHÆROGYNE. Included under **Tococa** (which *see*).

SPHÆROLOBIUM (from *sphaira*, a sphere, and *lobos*, a pod; alluding to the globular pods). ORD. *Leguminosæ.* A genus comprising thirteen species of greenhouse, evergreen, glabrous shrubs or under-shrubs, with Rush-like stems, generally leafless, restricted to Australia. Flowers yellow or red, disposed in terminal racemes, or in lateral racemes or clusters; calyx lobes imbricated, the two upper ones falcate, united; petals with short claws; standard orbicular or reniform, emarginate; wings rather shorter. Pods small, oblique, globular, or compressed. Leaves, when present, narrow, entire, alternate or irregularly opposite or whorled. Two of the species have been introduced: these succeed in a compost of loam and peat. Propagation may be freely effected by young cuttings, inserted in sand, under a glass.

S. acuminatum (taper-pointed). A synonym of *S. medium.*

S. medium (intermediate). *fl.* red or orange, usually numerous, densely clustered in terminal racemes; standard orbicular, rather longer than the calyx. Summer. *l.* on the barren branches small, subulate, often opposite or in whorls of three. Stems erect, 1ft. to 2ft. high; flowering ones leafless. 1803. SYN. *S. acuminatum.*

S. vimineum (twiggy). *fl.* yellow, numerous, usually clustered two or three together along the smaller branches, forming dense or interrupted, terminal racemes; petals about twice as long as the calyx; pedicels very short. Summer. Stems ascending or erect, from a few inches to 2ft. high, with slender, wiry branches; all leafless, or the barren ones bearing a few scattered, linear or narrow-lanceolate leaves, ¼in. long. 1802. (B. M. 969; L. B. C. 1753.)

SPHÆROMA. A synonym of **Sphæralcea** (which *see*).

SPHÆROPHORA (of Blume). A synonym of **Morinda** (which *see*).

SPHÆROPHYSA (from *sphaira*, a sphere, and *physa*, a bladder; alluding to the shape of the pods). Including *Phyllolobium.* ORD. *Leguminosæ.* A genus comprising three species of hardy, glabrous or hoary, perennial herbs or sub-shrubs, natives of Russian Asia or the Orient. Flowers red, disposed in axillary racemes; calyx teeth sub-equal, or the two upper ones approximating; standard orbicular, laterally reflexed, naked within; wings falcate-oblong; keel incurved at apex, obtuse. Pods long-stipitate, inflated. Leaves imparipinnate; leaflets three or numerous, entire, exstipellate. The species, like some other salt-loving plants, are difficult to preserve in gardens. *S. salsula* should be grown in sandy loam, and salted water should be occasionally applied. Propagation may be effected by seeds, which sometimes ripen in this country.

S. caspica (Caspian). A synonym of *S. salsula.*

S. salsula (salt-loving). *fl.* dirty pale purple, marked with more obscure veins. July and August. *l.* with eight pairs of oval, obtuse, mucronate leaflets. Stems erect, and, as well as the leaves, clothed with adpressed pubescence. *h.* 1½ft. Russia, Siberia to North China, 1818. SYN. *S. caspica.*

SPHÆROPSIDEÆ. A very large section of Fungi, resembling the *Pyrenomycetes* in external appearance, with pycnidia quite like perithecia except in size, but inclosing no asci, the sporidia being produced singly on the tips of more or less evident stalks, inside the pycnidia (these almost always open by a hole or slit). The plants were formerly regarded as true species, but now they are considered, with good reason, to be only an imperfect stage of species of *Pyrenomycetes.* Many of them grow on living plants, which they destroy or weaken. The leading genera parasitic on living plants are: *Ascochyta*, with two-celled, transparent, pale sporidia; *Diplodia*, with two-celled, brown sporidia; *Hendersonia*,

Sphæropsideæ—*continued.*

with brown, oblong or lanceolate sporidia, made up of a row of three or more cells; *Phoma* and *Phyllosticta*,

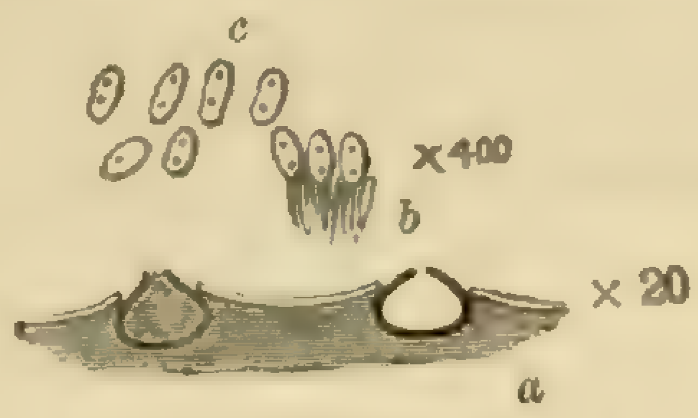

FIG. 511. PHOMA HERBARUM—*a*, Pycnidia in transverse section, × 20, one opened; *b*, Conidia still on the Stalks, × 400; *c*, Conidia free, after falling off the Stalks, × 400.

with transparent, elliptical, one-celled sporidia (see Fig. 511); *Septoria*, with long, slender, thread-like, pale sporidia; *Sphæropsis*, with elliptical, brown, one-celled sporidia; *Stagonospora*, like *Hendersonia*, but sporidia pale. The pycnidia are very similar in all the genera; but *Ascochyta*, *Phyllosticta*, and *Septoria* usually cause a discoloured spot on the leaves or stems of plants, in which the pycnidia are grouped. Such spots are seldom caused by the species of the other genera.

SPHÆROPTERIS (from *sphaira*, a globe, and *pteris*, a Fern; alluding to the globose involucres). ORD. *Filices.* A monotypic genus, the species being a stove Fern. For culture, *see* **Ferns.**

S. barbata (bearded). *fronds* 2ft. to 3ft. long, tripinnate; pinnules oblong, deeply pinnatifid. *sori* globose, on the back of a vein or veinlet; receptacle large; involucre inferior, globose, stipitate, at first inclosing the whole sorus, at length bursting vertically into two spreading lobes or lips. Nepaul, Sikkim, &c. SYN. *Peranema cyatheoides.*

SPHÆROSTEMA. Included under **Schizandra** (which *see*).

SPHÆROSTEPHANOS. Included under *Didymochlæna.*

SPHÆROSTIGMA. Included under **Œnothera** (which *see*).

SPHÆROTELE. Included under **Stenomesson** (which *see*).

SPHAGNUM (from *Sphagnos*, Moss). A genus of Mosses, found in all countries of the colder temperate zones. There are numerous species, but all delight in swamps, or in water; and they have, therefore, received the name of Bog-mosses. Seventeen species, and many varieties, have been recognised as British. So different is the genus *Sphagnum* from other Mosses in many respects, that it is placed in a distinct family, called *Sphagnaceæ.* It is easily recognised by the swampy habitats: by its erect stems, several inches long, and destitute of root-hairs; branches in clusters of from two to six, at frequent intervals along the stems, some spreading, others reflexed; male organs on lateral branches resembling small catkins; female organs in lateral branches like buds; capsules at first apparently sessile, then supported on short stalks, and conspicuous, globose, and bursting (often explosively) by a false lid, unlike the lids in true Mosses. The microscope shows peculiar structures also in the stems and leaves of *Sphagnum*, which deserve notice here, as they bear on the uses of the Mosses in gardening work. The middle of each stem consists of a mass of small cells, of a brown colour, inclosed in a layer of smaller and darker brown cells, with thicker walls. This structure is much like that of the stem of any common Moss. But the stems of the species of *Sphagnum* have an outer covering, composed of from one to four layers (according to the species) of much larger, transparent cells, with thin walls, which in most are pierced with holes, leading from cell to cell. The leaves are numerous, and are sessile, small, and more or less pointed. They have no midribs, and consist of a single layer of cells, among which there are two very different forms—the one long and narrow (inclosing protoplasm and chlorophyl bodies), forming a network, with large meshes, each filled by a transparent cell; the second form usually showing a thickening deposit in the shape of fibres, coiled in the interior round the walls, which are pierced by holes like those in the cells of the layers surrounding the stem. As in the latter, the transparent cells in the leaves, when mature, contain no protoplasm or chlorophyl. Their special duty is to suck in water from the swampy soil through the holes in their walls, and to pass it on from cell to cell upwards. They thus do the work of root-hairs, which are not present in these plants. This structure renders the Mosses of the genus *Sphagnum* almost as absorbent as a sponge, as may be easily proved by squeezing the water out of a clump of Moss, and again dipping the latter into water. The species all grow in compact tufts or mosses, often covering a considerable area. The plants tend to grow upwards, and to die in proportionate rate below. Some of the branches grow so large as to give the appearance of bifurcations of the stems; and, as these die away below, the stems and branches become separated, and form new plants. In this way, one form of multiplication of the individuals is secured. Reproduction is also effected by the spores, produced in the capsules. These are quadrangular in form. If they fall on damp soil, they produce flattened, branched, thin, green plates, on which Moss-plants grow from small buds. If the spores fall into water, they produce slender, branched, green threads, like those of other Mosses; and on these buds are formed, from which the Moss-plants grow.

The Bog-mosses are very important agents in the production of Peat Mosses and swamps, as they prevent the water from flowing away, and, by growing upwards and dying away beneath, add to the depth of the peat, though peat formed by them requires a long time to become firm suitable for fuel.

Uses. In gardens, *Sphagnum* is of much use, inasmuch as, when dry, it makes admirable packing material, being light, firm, and very elastic. The power of absorbing and retaining moisture renders the wet Sphagna excellent for packing round cuttings and young plants to be sent to a distance, as they supply water when it is needed. These Mosses are also much used in greenhouses for growing epiphytal Orchids or other plants of similar habits, which require plenty of moisture.

SPHENANDRA (from *sphen*, a wedge, and *aner*, *andros*, a male or anther; alluding to the shape of the anthers). ORD. *Scrophularineæ.* A monotypic genus. The species is a greenhouse, viscous-pubescent, annual or perennial herb. It thrives in loamy soil, and may be increased by seeds.

S. viscosa (clammy). *fl.* violet, pedicellate, loosely racemose; calyx five-parted; corolla broadly rotate, with five broad, entire, spreading lobes; stamens four. June. *l.* mostly opposite, oblong-lanceolate, with a few teeth; floral ones much smaller, ovate, entire, very acute or bract-like. *h.* 1ft. South Africa, 1773. (B. M. 217, under name of *Buchnera viscosa.*)

SPHENODESMA (from *sphen*, a wedge, and *desme*, a fascicle; alluding to the form of the inflorescence). SYNS. *Roscoea* (of Roxburgh), *Viticastrum.* ORD. *Verbenaceæ.* A genus consisting of about eight species of stove, climbing shrubs, natives of the Eastern provinces of India and the Malayan Archipelago. Flowers in rather small, pedunculate, sessile cymes; calyx five-toothed; corolla tube short, the limb spreading, of five ovate or oblong lobes; stamens five. Leaves opposite, entire. *S. pentandra*, the only species introduced, thrives in sandy loam. It may be increased by cuttings, inserted in sand, under a glass, in heat.

Sphenodesma—*continued.*

S. Jackiana (Jack's). A synonym of *S. pentandra.*

S. pentandra (five-anthered). *fl.* six in a head; corolla purple, the tube equalling the calyx, the throat white and very hairy; panicle ample, leafy below; peduncles filiform. June. *l.* shortly petiolate, oblong, obtuse at base, attenuated-acuminate, highly glabrous and shining above, pubescent beneath. *h.* 6ft. East India, 1823. SYN. *S. Jackiana.*

SPHENOGYNE. Included under **Ursinia** (which *see*).

SPHENOTOMA. Included under **Dracophyllum** (which *see*).

SPHEROIDAL. Approaching a sphere in shape.

SPHINGIDÆ (Hawk Moths). A family of Moths of very distinct and striking aspect, characterised by the thick, heavy body, and long, pointed wings, which are moved by powerful muscles. This allows of very rapid flight, except in a few (*Smerinthus*), in which the wings are broader, but weaker, and flight is slow and heavy. The moths are large, certain species, *e.g.*, Death's Head Moths, being among the largest of British insects. The antennæ are usually thicker in the middle, and end in a hooked bristle. The larvæ are generally peculiar in form, being rather thick, tapering from a little in front of the middle towards the head, but cut off abruptly behind, where a curved "horn" is present just above the blunt hinder end. Most of the larvæ are ornamented with seven oblique coloured lines on the sides. Those of several species have a habit of drawing back the head into the segments just behind it, and assume an attitude fancifully supposed to resemble the Egyptian Sphinx; and from this habit the family name has been derived. The popular name of "Hawk Moths" refers to their swiftness of flight. They mostly fly in the dusk of evening and of early morning; but one, the Humming Bird Moth, flies by day. Several of the species feed, as larvæ, upon garden produce, or on bushes and trees. *Acherontia Atropos* (formerly called *Sphinx Atropos*), the Death's Head Hawk Moth (see Fig. 512), feeds almost entirely on Potatoes (see remarks on INSECTS, under **Potato**), less often on Jasmine and the Tea-tree; but the larva, though very large, is not often seen, because of its habit of feeding only in darkness, concealing itself in the soil by day.

FIG. 512. DEATH'S HEAD HAWK MOTH (*Acherontia Atropos*).

The Hawk Moths that feed on cultivated trees and shrubs are the following: The Eyed Hawk Moth (*Smerinthus ocellatus*), on Apple and other fruit-trees, as well as on Willows, Poplars, &c. The moth reaches about 3in. in spread of wings, and is easily known by the

Sphingidæ—*continued.*

rosy-brown wings, clouded with olive-brown markings, and especially by a large, bluish, eye-like spot on each hind wing near the hind angle. The larva is green, with a blue horn; the seven oblique stripes on each side are white, edged with dark green above. The Poplar Hawk Moth (*S. Populi*) lives on Poplars and Willows, and on Laurel and Laurustinus. The moth reaches about 3in. across the wings, which are grey, with darker bands and a white dot in the middle of each fore wing, and a red patch at the base of each hind wing. The larva is green, sprinkled with yellow; the horn is yellow above, redder beneath; and the oblique stripes on the sides are yellow. This insect is the most plentiful of the family. The Lime Hawk Moth (*S. Tiliæ*) is less common. The moth reaches from 2½in. to 3in. across the wings. The fore wings have the outer edge a good deal indented; they are pale reddish or olive-brown, with a broad, greenish outer border, and a dark olive-green band across the middle, often broken so as to form two spots. The hind wings are blackish at the base, brown elsewhere, with a darker band across each. The larva feeds on Limes and Elm-trees. It is green, sprinkled with yellow dots, and the oblique stripes are yellowish, sometimes edged with red; the horn is blue above, yellow beneath, and behind it is a flat, purple scale edged with orange. The Privet Hawk Moth (*Sphinx Ligustri*) feeds on Privet and Lilac, and is common in the southern counties of England. The fore wings often exceed 4in. in spread, and are more pointed and narrower than in those insects already mentioned; they are pale brown, clouded with darker brown, and streaked with black; the hind wings are rosy-red, with three black cross-bars. The larva is bright green; the horn is black above and at the tip, and yellow beneath; the oblique streaks on the sides are white behind, delicate purple in front; the skin is smooth. The large Elephant Hawk Moth (*Chærocampa elpenor*) feeds on Willowherb, Fuchsia, and Vine. The moth reaches 2½in. in spread of the fore wings, which are pointed, and are olive-green, with pink outer and front margins, and two pink, oblique cross-bars; the base of each hind wing is black, and the rest of it pink. The larva is green, dark grey, or brown, with black mottlings. On each side of the fifth and sixth rings of the body is a large black patch, inclosing a white, kidney-shaped spot, the whole resembling an eye. The horn is short and black, with the tip white; the front rings of the body are narrowed and retractile, and when they are retracted the form of the larva has been fancifully compared to an elephant's head, the spots mentioned above resembling the eyes. This moth is common in many places.

Remedies. The only remedy necessary is hand-picking the larvæ, if they become so numerous as to require it. Their large size renders them easily seen, though their colours usually assimilate well with those of their food-plants. The larvæ of *A. Atropos* require to be looked for with a lantern at night, as they hide in the soil by day. The larvæ of almost all the Hawk Moths go underground to become pupæ, and little can be done to diminish the number of pupæ, or of perfect insects. The pupæ of *A. Atropos* are occasionally found when Potatoes are being harvested in gardens and in fields.

SPHINX ATROPOS. *See* **Sphingidæ.**

SPICATE. Resembling a spike; disposed in spikes.

SPICE BUSH. *See* **Lindera Benzoin.**

SPICILLARIA. A synonym of **Petunga** (which *see*).

SPIDER FLOWER. A common name for *Cleome.*

SPIDER ORCHIS. *See* **Ophrys aranifera.**

SPIDERS. The true Spiders are very helpful to gardeners, inasmuch as they live upon insects, and destroy multitudes of the hurtful kinds. The larger Spiders, such as the "Garden Spider" (*Epeira diademata*), live on the smaller Moths and the larger Flies, and the smaller Spiders aid largely to destroy the swarms of Aphides. Spiders vary much in habits. Many of them (*e.g.*, *Lycosa*, *Salticus*) spin no webs, but hunt their prey; while others spread webs, often of great complexity and beauty, in which to catch their food, while they lie concealed in a retreat close at hand, ready to rush upon every insect that touches the web. Gossamer is the work of many small, dark Spiders, belonging to the genera *Linyphia*, *Neriene*, and *Walckenæra*.

Red Spider is not a true Spider, but a Mite of microscopic size, which spins a thin web over the surfaces of leaves, and often materially injures plants by sucking out the sap from the leaves. *See* **Tetranychus telarius.**

SPIDERWORT. A common name for *Tradescantia* and other plants.

SPIELMANNIA. A synonym of **Oftia** (which *see*).

SPIGELIA (named in honour of Adrian Spiegel [Latinised *Spigelius*], 1578-1625, Professor of Anatomy and Surgery at Padua, and a botanical author). SYNS. *Canala*, *Cœlostylis*. ORD. *Loganiaceæ*. A genus comprising about thirty species of stove, greenhouse, or hardy, glabrous, scarcely pilose, or stellate-tomentose, annual or perennial herbs, rarely sub-shrubs, natives of tropical and North America. Flowers red, yellow, or purplish, elongated or small, in unilateral, many or few-flowered spikes; calyx five-parted, the segments narrow; corolla tubular or salver-shaped; lobes five, valvate, at length spreading; stamens five, affixed to the tube. Leaves opposite, often membranous, penniveined or rarely three or five-nerved, connected by stipules or by a transverse membrane. The three species introduced are pretty plants, but are not often seen in cultivation. The Indian Pink, Pink Root, or Worm Grass, of the shops, is the produce of *S. marilandica*. A compost of loam and peat is most suitable for these plants. *S. anthelmia* may be propagated by seeds, and the other two species by cuttings.

S. anthelmia (worm-killing). Pink Root of Demerara. *fl.* of a purplish-white; corolla slender, ⅓in. long; spikes one to four in the upper axils. July. *l.* scarcely petiolate; lower ones opposite; uppermost ones quaternately whorled, ovate-oblong, acuminate at both ends. *h.* 1½ft. Guatemala to Brazil, 1759. Stove annual. (B. M. 2359.)

S. marilandica (Maryland).* Indian Pink; Maryland Pink Root; Worm Grass. *fl.* red outside, yellow within; corolla 1½in. long, the lobes lanceolate; spikes simple or forked, short. July. *l.* sessile, ovate-lanceolate, acute. Stems simple and erect from a perennial root. *h.* 6in. to 18in. North America, 1694. A showy, hardy plant. (B. M. 80; B. M. Pl. 180; L. B. C. 930.)

S. splendens (splendid).* *fl.* bright scarlet, upwards of 1in. long; corolla cylindric, slightly inflated upwards; spikes several towards the apex of the stem, elegantly recurved. July. *l.* 4in. to 5in. long, contracted into a short petiole, obovate-oblong, acuminate, slightly hairy. *h.* 1½ft. Mexico and Guatemala, 1860. A beautiful, stove perennial. (B. H. 1862, 65; B. M. 5268; R. G. 481.)

SPIGNEL. *See* **Meum athamanticum.**

SPIKE. An inflorescence in which the flowers are sessile along a simple, undivided axis or rachis.

SPIKELET. A secondary spike; the term is especially applied to the small, terminal collection of florets in grasses.

SPIKENARD, or NARD. *See* **Nardostachys.**

SPIKENARD, PLOUGHMAN'S. *See* **Baccharis.**

SPILANTHES (from *spilos*, a spot, and *anthos*, a flower; in allusion to the original species having yellow florets and a brown disk). Sometimes spelt *Spilanthus*. Including *Acmella*. ORD. *Compositæ*. A genus of about a score species of annual or rarely perennial herbs, inhabiting warm regions. Flower-heads yellow or white, with a yellow disk, often long-stalked, heterogamous. Leaves opposite, often toothed. The species have no garden value. *S. oleracea* (Para Cress) is cultivated in the tropics as a salad plant, and is now and then met with in botanical collections.

S. crocata. *See* **Verbesina crocata.**

SPILANTHUS. *See* **Spilanthes.**

SPILOSOMA MENTHASTRI. This insect, generally known as the White Ermine Moth, is one of the commoner of the *Bombycidæ*, at least in the larval stage. The larvæ are found in autumn on almost every low plant, including all kinds of cultivated herbs. They reach a length of over 1in., are stout in form, and are covered thickly with hairs of a brown or nearly black colour, but show a paler line down the middle of the back. In late autumn, they are commonly seen crawling on roads, on walls, and, in fact, everywhere, in the search for safe retreats in which to become pupæ. In summer, the moths emerge. The fore wings are rather rounded, and reach about 1¾in. in expanse. They are creamy-white, with about thirty small black spots on each, forming four very irregular, curved rows; the hind wings are pure white, and bear three or four small black spots; the head and thorax are white, the abdomen orange-yellow, with a row of black spots down the middle, and also down each side; the body is thick and clumsy.

Remedy. Hand-picking is the most effectual, as the larvæ are easily detected; but they seldom do serious harm; and they may even be regarded as occasionally useful, since they feed on troublesome weeds. The "White Ermine" has allies which feed almost wholly on weeds, viz., the "Buff Ermine" (*S. lubricipeda*), which is buff-colour, with small, dark spots, and a dark, oblique cross-bar; the "Water Ermine" (*S. Urticæ*), with the wings white, with two black dots; and the "Muslin Moth" (*Diaphora mendica*), of which the female has semi-transparent white wings, and the male is smoke-coloured; the wings show black spots in both sexes.

SPINACH (*Spinacia oleracea*). An annual, cultivated for its leaves, which are cooked and served as a vegetable. It may be raised in any quantity from seed, which should be sown successionally through the summer, where the plants are intended to remain. Spinach prefers a deep, rich soil, and a rather moist situation, through the summer; for the winter crop, a drier and rather warm position should be selected. The first sowing may be made at the latter end of February, or early in March, according to the weather and the state of the ground. To maintain a supply, a sowing should be made about every fortnight, or at longer intervals, if there is but little demand for the leaves, as in dry weather the plants soon run to seed. Sow in drills 1in. deep, and about 1ft. apart. In May, and the two following months, single drills between rows of Beans or Peas may be sown with good success, as here partial shade is provided, and no injury is caused to the other crops, if the ground is good, Spinach being such a quick-growing subject. When the ground is dry, watering is of great advantage, or it may be newly turned up with a fork, and the seeds steeped about four hours in water, then sown at once. In order to obtain good-sized leaves, the plants should be thinned to 4in. or 6in. apart, so soon as they are large enough. In picking, the largest leaves should be selected, particularly during winter and early spring, when but little new growth is made.

Spinach—*continued.*

Spinach intended for standing through the winter should be sown, according to the locality, from the middle of August till the middle of September, when it is tolerably certain not to run to seed before winter. In unfavourable districts, the former date will not be too soon, while the latter will suit some localities. As before noted, a favoured spot should be selected, and the drills should be rather wider apart than for the summer crops: about 15in. will be close enough. It is often advisable to make two sowings for winter, as, if the first proves too early, the second may be better depended upon to succeed.

Sorts. These are not numerous; they are divided into two classes, which are distinguished by the seeds, one being smooth, the other prickly. The Round-seeded, known as Summer Spinach, is most extensively grown in summer; the Prickly, or Winter Spinach, is the hardier of the two, and is sown for withstanding the winter. Flanders Spinach and Lettuce-leaved Spinach are varieties of the Round-seeded class, which are not always distinguished and grown separately from the common sort.

Fungi. The only Fungus that has been recorded as seriously destructive to Spinach is *Peronospora effusa.* For an account of this parasite, *see* **Peronospora.** Plants attacked by it should be removed without delay, and, if possible, burned, to destroy the spores of the Fungus.

Insects. The insect pests are not numerous, and there are none that can be regarded as peculiarly attached to this plant. Its chief foes are larvæ of Moths, such as are described under the headings **Noctua, Plusia, Potherb Moths,** and **Surface Caterpillars,** where also information will be found as to the remedies to be employed against their ravages.

When the plants are allowed to run to seed, the inflorescence is often infested by *Aphis Rumicis,* and other kinds of Green Flies. *See* **Aphides.**

SPINACH, MOUNTAIN. A name applied to *Atriplex hortensis.*

SPINACH, NEW ZEALAND. *See* **Tetragonia expansa.**

SPINACH, WILD. A common name for *Chenopodium Bonus-Henricus.*

SPINACIA (from *spina*, a prickle; alluding to the prickly processes of the fruit). Spinach. ORD. *Chenopodiaceæ.* A small genus (four species) of hardy, annual, erect, glabrous herbs, natives of the Orient. Flowers diœcious, very rarely hermaphrodite, glomerate; male glomerules in terminal, interrupted spikes, females often axillary. Leaves alternate, petiolate, triangular-ovate or hastate, entire or sinuate-toothed. *S. oleracea,* a valuable herb, is the only species calling for description here. For culture, &c., *see* **Spinach.**

S. oleracea (culinary). *fl.*, males green, growing in long, terminal spikes; females axillary, sessile, clustered. June. Seeds in some varieties prickly, in others smooth. *l.* large, thick, succulent, somewhat triangular, deep green, on long petioles. Stem erect, large, round, hollow, about 2ft. high. 1568. The varieties *glabra* and *spinosa* represent the ROUND and PRICKLY SEEDED varieties.

SPINDLE-TREE. *See* **Euonymus.**

SPINE. A sharp-pointed, woody or indurated body; a hardened leaf-stalk, stipule, abortive branch, or any other process into the composition of which woody tissue enters.

SPINESCENT. Terminating in a sharp point or spine.

SPINOSE. Furnished with spines; of a spiny character.

SPINULIFEROUS, SPINULOSE. Furnished with diminutive spines.

SPIRÆA (the old Greek name used by Theophrastus, probably from *speiras,* to wind; alluding to the fitness of the plants for forming into garlands). Meadow-sweet. ORD. *Rosaceæ.* A genus comprising about fifty species of handsome (mostly deciduous and hardy) shrubs, sub-shrubs, or herbs, broadly dispersed over the temperate and sub-frigid regions of the Northern hemisphere, rarely found in the tropics. Flowers pink or white, axillary or terminal, variously clustered; calyx persistent, with an urceolate, campanulate, or concave tube, and a limb of four or five imbricated or valvate lobes; petals four or five, rounded, shortly clawed; stamens twenty to sixty, in one, two, or three series. Leaves alternate, simple or pinnate, or twice or thrice ternate; stipules free, or adnate in a sheath at the bases of the petioles, rarely obsolete. The shrubby species succeed in almost any soil in open situations. The perennials prefer moist places and loamy soil, particularly *S. palmata* and *S. Ulmaria,* which succeed well by the side of water. Shrubby Spiræas are propagated by cuttings of the young wood, inserted in sandy soil, and kept close and shaded until rooted; or by means of the root-offsets which are so freely produced by most of the species. The perennials may be increased by divisions.

A modification of Maximowicz' key to the genus is given below. Some of the sections are looked upon as distinct genera by that author.

Aruncus.

Flowers diœcious; calyx withering in fruit, hypogynous with the stamens. Carpels normally three, cartilaginous. Leaves repeatedly divided in a ternate manner.

Aruncus
astilboides

Eriogynia.

Flowers hermaphrodite; calyx persistent in fruit, perigynous with the stamens. Carpels two-valved, membranous, free; seeds resembling sawdust. Leaves twice ternately divided.

pectinata

Spiræa proper.

Flowers hermaphrodite, rarely polygamous; calyx persistent in fruit, perigynous with the stamens. Carpels one-valved, cartilaginous, free; seeds several, more or less appendiculate; albumen none or almost obsolete.

SECTION I. PETROPHYTUM.

Flowers racemose; pedicels of equal length, sometimes very short.

cæspitosa

SECTION II. CHAMÆDRYON.

Flowers not truly racemose; pedicels of the corymbs or clusters one-flowered, of unequal length.

Series 1. Leaves of the flowering and sterile branches somewhat dissimilar, commonly very short.

alpina
crenifolia
hypericifolia
prunifolia flore-pleno
Thunbergii

Series 2. Leaves of the flowering and sterile branches similar, usually elongated.

Blumei
cana
cantoniensis
chamædrifolia
chinensis
media
pubescens
trilobata

SECTION III. SPIRARIA.

Corymbs or panicles compound.

Series 1. Flowers corymbose.

bella
betulifolia
canescens
decumbens
gracilis
japonica
vaccinifolia

Series 2. Flower paniculate.

Douglasii
salicifolia
tomentosa

Sibiræa.

Flowers paniculate, diœcious.

lævigata

Spiræa—*continued.*

Holodiscus.

Flowers in ample, many-flowered, terminal panicles; stamens longer than the petals.

discolor

Filipendula.

Herbaceous perennials. Flowers in axillary or terminal cymes. Leaves interruptedly pinnate.

Filipendula
lobata
palmata
Ulmaria
vestita

Sorbaria.

Ovules pendulous; carpels coriaceous, cohering at the base, completely splitting into two halves; seeds several. Leaves large, membranous, pinnately divided.

grandiflora
Lindleyana
sorbifolia

Chamæbatiaria.

Leaves bipinnatisect, Milfoil-like.

Millefolium.

The most popular species and varieties are here described. Except where otherwise indicated, all are hardy, deciduous shrubs.

FIG. 513. UPPER PORTION OF PLANT OF SPIRÆA ARUNCUS.

S. acutifolia (acute-leaved). A synonym of *S. hypericifolia acuta.*

S. alba (white). A synonym of *S. salicifolia paniculata.*

S. alpina (alpine). *fl.* white; sepals ascending; corymbs terminal, stalked, and in many instances leafless, large in proportion to the leaves. June and July. *l.* oblong-lanceolate, sessile, serrulated, glabrous; midrib pinnately branched. *h.* 4ft. to 6ft. Siberia, 1806.

S. amurensis (Amur). A synonym of *Neillia amurensis.*

S. ariæfolia (White-beam-leaved). A synonym of *S. discolor ariæfolia.*

S. Aruncus (Aruncus). Goat's Beard. *fl.* whitish, in many slender spikes, disposed in a long, compound panicle. June. *l.* thrice-pinnate; leaflets thin, lanceolate-oblong, or the terminal ones ovate-lanceolate, taper-pointed, sharply cut and serrated. *h.* 4ft. Northern hemisphere, 1633. Herbaceous perennial. See Fig. 513.

S. A. americana (American). A form with the interrupted male flowers scarcely larger than the female ones. Follicles more than twice as long as broad. North America, Japan, and China. In the Japanese Alps, this sometimes occurs only 1ft. in height.

S. A. triternata (triternate). *fr.*, carpels twice (often more than three times) as long as broad. *l.* frequently clothed with ashy pubescence beneath. Himalaya.

S. astilboides (Astilbe-like). *fl.* white, in spicate panicles. Summer. Japan. In general aspect, this species resembles *S. Aruncus*, but it is considerably dwarfer in stature, and much more graceful in character. A handsome perennial. See Fig. 514, for which we are indebted to Mr. Wm. Bull.

S. barbata (bearded). A synonym of *Astilbe japonica.*

S. bella (pretty). *fl.* of a beautiful red colour; calyx lobes deflexed; cymes terminal, spreading, and, as well as the branches, pubescent. July and August. *l.* ovate, glabrous, serrated, petiolate, glaucous beneath. Stems glabrous, rufous. *h.* 2ft. to 3ft. Himalaya, 1820. (B. M. 2426.)

S. betulifolia (Birch-leaved). *fl.* creamy-white; corymbs large, flat, several times compound. June. *l.* simple, oval or ovate, cut-toothed towards the apex; stipules obsolete. *h.* 1ft. to 2ft. North-eastern Asia and North America, 1819. Shrub nearly smooth. SYN. *S. corymbosa* (L. B. C. 671).

S. Blumei (Blume's). *fl.* white; cymes pedunculate, terminal, and, as well as the calyx, glabrous. *l.* obovate, obtuse, deeply toothed at the apex, rather smooth. *h.* 3ft. to 6ft. Japan. (B. H. 1858, 37, f. 2.)

S. Boursierii (Boursier de la Rivière's). A synonym of *S. discolor dumosa.*

S. cæspitosa (tufted). *fl.* white, densely spicate-racemose. Summer. *l.* small, silky, entire; radical ones rosulate, spathulate; cauline ones linear, minute. *h.* 6in. Northern Mexico, Nevada, &c.

S. callosa (callous-leaved). A synonym of *S. japonica.*

S. c. alba (white). A synonym of *S. japonica alba.*

S. c. rosea (rosy). A synonym of *S. japonica splendens.*

S. c. superba (superb). A synonym of *S. japonica superba.*

S. cana (hoary-leaved). *fl.* white; sepals spreading; styles thick; corymbs somewhat racemose, the lateral ones pedunculate, loosely few-flowered. June and July. *l.* ovate, ½in. to 1½in. long, acute, quite entire or slightly toothed, hoary-villous. *h.* 1ft. to 2ft. Croatia, 1825.

S. canescens (hoary). *fl.* pale pink or white; corymbs crowded, and, as well as the branches, tomentose. Summer. *l.* oval or obovate, obtuse, stalked, quite entire, villous. Himalaya, 1879. An erect, branched, canescent shrub, with the habit of *S. hypericifolia.*

S. cantoniensis (Canton).* *fl.* white and showy, disposed in terminal umbels. Early summer. *l.* small, simple, lanceolate, three-lobed, deeply toothed. *h.* 3ft. to 4ft. Japan, 1843. A glabrous, hardy, evergreen shrub. SYN. *S. Reevesiana* (B. R. xxx. 10). There is a double-flowered variety of this species in cultivation, which is highly desirable. (F. d. S. 1097.)

S. ceanothifolia (Ceanothus-leaved). A synonym of *S. chamædrifolia.*

S. chamædrifolia (Germander-leaved). *fl.* white, disposed in hemispherical corymbs; sepals reflexed; pedicels slender, elongated. June and July. *l.* ovate, deeply serrated at the apex, pubescent. *h.* 1ft. to 2ft. South-eastern Europe to Japan, &c., 1789. SYN. *S. ceanothifolia.*

S. c. flexuosa (flexuous). *fl.* generally smaller than those of the type. *l.* elliptic-lanceolate, unequally serrated, hardly incised. Eastern Siberia, &c. SYN. *S. flexuosa.*

S. c. ulmifolia (Elm-leaved). *fl.* white, disposed in nearly

FIG. 514. SPIRÆA ASTILBOIDES, showing Habit and detached Inflorescence.

Spiræa—*continued.*

hemispherical, terminal corymbs; sepals reflexed. June and July. *l.* ovate-lanceolate, acute, flat, sharply serrated, glabrous. *h.* 3ft. to 5ft. Siberia, &c., 1790. A handsome shrub. (B. R. 1222 and L. B. C. 1042, under name of *S. chamædrifolia.*)

S. chinensis (Chinese). *fl.* pure white, small, slightly fragrant, arranged in small, hemispherical corymbs. March. *l.* ovate-oblong, 1½in. long, acute, much wrinkled, deeply serrated, subtrilobed, beneath, as well as on the branches, pubescent. *h.* 2ft. Central China, 1843. SYN. *S. pubescens*, of Lindley (B. R. xxxiii. 38).

S. confusa (confused). A synonym of *S. media.*

S. corymbosa (corymbose). A synonym of *S. betulifolia.*

S. crenifolia (crenate-leaved). *fl.* white, in many-flowered, racemose corymbs, generally subtended by foliaceous bracts; stamens longer than the petals. Summer. *l.* stalked, round-oval, sharply toothed, rarely entire. North-east Asia.

S. decumbens (decumbent). *fl.* white, in terminal corymbs. Summer. *l.* roundish-oval, crenately-toothed. Tyrol. A dwarf, trailing shrub, suitable for covering rocks and banks. (G. C. n. s., xii., p. 752.)

S. discolor ariæfolia (discoloured, White-beam leaved). *fl.* dirty-white, in elegant, nodding panicles. Summer. *l.* rigid, cuneate at base, dark green above, silvery beneath; those on young growths about the size and shape of those of the Hawthorn. *h.* 4ft. to 10ft. North-west America. SYN. *S. ariæfolia* (B. R. 1365).

S. d. dumosa (brambly). This differs from the last-named plant in its less compound panicles and much smaller stature. See Fig. 515. SYNS. *S. Boursierii* (R. H. 1859, 519), *S. dumosa.*

S. Douglasii (Douglas').* *fl.* rose-coloured, nearly sessile, in a dense, terminal, thyrsoid panicle, 6in. to 9in. in length. August. *l.* simple, oblong-lanceolate, obtuse, serrulated towards the apex, covered with a white down beneath. *h.* 3ft. North-west America. (B. M. 5151; L. & P. F. G. ii. 178; R. H. 1846, 6.)

S. D. Nobleana (Noble's). *fl.* purplish-red; inflorescence looser than in the type. *l.* elliptic or oblong, obtuse or acute, more or less toothed, pubescent or almost glabrous beneath. California, 1859. (B. M. 5169 and I. H. 286, under name of *S. Nobleana.*)

FIG. 515. FLOWERING BRANCH OF SPIRÆA DISCOLOR DUMOSA.

S. dumosa (brambly). A synonym of *S. discolor dumosa.*

S. Filipendula (Filipendula).* Dropwort. *fl.* white, or rosy outside, ¾in. in diameter; cymes loose, panicled; peduncles slender. June and July. *l.* interruptedly pinnate, glabrous, 4in to 10in. long, chiefly radical; leaflets many, sessile, deeply cut-serrate, ½in. to ¼in. long, the terminal one three-lobed; stipules of cauline leaves toothed. Stem 2ft. to 3ft. high, erect, grooved, with a few small leaves. Europe (Britain), &c. Tuberous, herbaceous perennial. See Fig. 516. (Sy. En. B. 416.) There is a form of this with double flowers.

S. flagellata (whip-like). A synonym of *S. hypericifolia.*

S. flexuosa (flexuous). A synonym of *S. chamædrifolia flexuosa.*

S. Fortunei (Fortune's). A synonym of *S. japonica.*

S. gracilis (slender). *fl.* white, corymbose (with long, capillary pedicels); corymbs in lax, spreading, rounded, glabrous panicles. July and August. *l.* obtuse or orbicular, elliptic, glabrous, glaucous beneath, serrated at the apex. Branches hairy. *h.* 2ft. Nepaul, 1820. (L. B. C. 1403, under name of *S. vaccinifolia.*)

S. grandiflora (large-flowered). *fl.* white, corymbose. July and August. *l.* pinnate; leaflets serrately incised. *h.* 2ft. to 3ft. Siberia, &c. Sub-shrub. This much resembles *S. sorbifolia*, but the flowers are twice as large as those of that species, and the leaves are smaller. SYN. *S. Pallasii.*

S. grandiflora (large-flowered), of Hooker. A synonym of *Exochorda grandiflora.*

S. grandiflora (large-flowered), of Loddiges. A synonym of *S. salicifolia grandiflora.*

S. hydrangeæfolia (Hydrangea-leaved). A synonym of *S. japonica splendens.*

S. hypericifolia (Hypericum-leaved). *fl.* white, in either peduncled corymbs or sessile umbels; pedicels glabrous or slightly downy. June and July. *l.* obovate-oblong, three or four-nerved, entire or toothed, glabrous, slightly downy. *h.* 4ft. to 6ft. Asia Minor to Eastern Siberia, &c., 1640. SYN. *S. flagellata.*

S. h. acuta (acute-leaved). *fl.* in sessile corymbs. *l.* spathulate, elongated, acute, perfectly entire or rarely three to five-toothed, rather glabrous. SYN. *S. acutifolia.*

S. h. Besseriana (Besser's). *fl.* in rather loose, terminal corymbs. *l.* mostly entire. Plant rather glabrous. (L. B. C. 1252.)

S. h. crenata (crenate-leaved). A variety with obovate leaves.

S. h. thalictroides (Meadow-rue-leaved). *fl.* in a few-flowered, sessile corymb; stamens as long as the petals. June and July. *l.* smooth, glaucous, obovate, entire; those on the barren shoots cuneate-obovate or sub-deltoid. Mongolia. SYN. *S. thalictroides.*

S. japonica (Japanese). *fl.* rosy-red, disposed in terminal, flat corymbs. June. *l.* glabrescent, simple, lanceolate, acute, sharply serrated; serratures thickened at the tips.

Spiræa—*continued.*

h. 4ft. to 6ft. China, Japan, &c., 1859. A very handsome and desirable, greenhouse, evergreen shrub. SYNS. *S. callosa* (L. & P. F. G. ii. 191), *S. Fortunei* (B. M. 5164; F. d. S. 871).

FIG. 516. INFLORESCENCE OF SPIRÆA FILIPENDULA.

S. j. alba (white). *fl.* white. A compact, pretty bush, not more than 1ft. high. SYN. *S. callosa alba.*

S. j. rubra (red). A very handsome variety, having dark red flowers (R. H. 1862, p. 100.)

S. j. splendens (splendid). *fl.* peach-coloured. A dwarf-growing, floriferous plant, adapted for forcing. Garden origin. SYNS. *S. callosa rosea, S. hydrangeæfolia, S. splendens.*

S. j. superba (superb). *fl.* deep rose-red. A fine garden form. SYN. *S. callosa superba.*

S. japonica (Japanese), of gardens. The plant commonly known by this name is **Astilbe japonica** (which *see*).

S. lævigata (smooth). *fl.* white, tinged with rose, diœcious; male panicles larger and looser, in longer, interrupted racemes; female panicles smaller and more dense, in closely-packed, continuous racemes of smaller flowers. June. *l.* entire, oblong-lanceolate, glaucous, glabrous. *h.* 2ft. to 3ft. Siberia.

S. laxiflora (loose-flowered). A synonym of *S. vaccinifolia.*

S. Lindleyana (Lindley's).* *fl.* white, disposed in large, terminal panicles. September. *l.* large, unequally pinnate; leaflets eleven to twenty-one, sessile, ovate-lanceolate, coarsely serrated, glaucous beneath. *h.* 4ft. to 8ft. Himalayas. (B. R. 33.)

S. lobata (lobed). Queen of the Prairie. *fl.* deep peach-blossom colour, handsome; sepals and petals often in fours; panicle compound-clustered. June. *l.* interruptedly pinnate; terminal leaflet very large, seven to nine-parted, the lobes incised and toothed; stipules reniform. *h.* 2ft. to 8ft. North America, 1765. A glabrous, herbaceous perennial. The bruised foliage exhales the odour of Sweet Birch. (R. G. 397.) SYN. *S. venusta* (of gardens).

S. l. albicans (whitish). A chance seedling, raised near Metz, differing from the type in its lighter rose-coloured flowers. SYN. *S. venusta albicans.*

S. media (intermediate). *fl.* white, corymbose; stamens longer than the petals. June and July. *l.* elliptic-lanceolate, acute, more or less serrated, three or four-ribbed, hairy beneath, rarely entire or with a few large teeth towards the apex. Branches terete, sub-erect. *h.* 2ft. to 4ft. Northern Asia, &c. SYNS. *S. confusa, S. oblongifolia.*

S. m. rotundifolia (round-leaved). *fl.* pure white, scented, corymbose, abundantly produced. *l.* elliptic, three-toothed at apex. Japan, 1885. A handsome garden variety. (G. C. n. s., xxiii. 56.)

Spiræa—*continued.*

S. Millefolium (Milfoil-leaved). *fl.* whitish, in many-flowered racemes at the tips of the branches. Summer. *l.* glabrous above, stellate-tomentose beneath, much resembling in cutting those of the common Milfoil. California, &c., 1880. A low, evergreen shrub. SYN. *Chamæbatiaria Millefolium.*

S. Nobleana (Noble's). A variety of *S. Douglasii.*

S. oblongifolia (oblong-leaved). A synonym of *S. media.*

S. opulifolia (Guelder Rose-leaved). A synonym of *Neillia opulifolia.*

S. Pallasii (Pallas'). A synonym of *S. grandiflora.*

FIG. 517. SPIRÆA PALMATA.

S. palmata (palmate-leaved).* *fl.* of a brilliant crimson, disposed in large, corymbose panicles. June to August. *l.* palmately five to seven-lobed; lobes oblong, acuminated, acutely and doubly serrated. Stems (as well as the peduncles) crimson. *h.* 1ft. to 2ft. Japan, 1823. A beautiful, herbaceous perennial; it is one of the most striking and effective species in cultivation. See Fig. 517. (B. M. 5726.)

S. p. alba (white). This differs from the type in its white flowers and lighter green leaves.

S. p. elegans (elegant). A very fine garden plant, having large, paniculate corymbs of white flowers with red anthers, and pinnatisect leaves. 1878. (F. & P. 1878, 463.) Although figured under this name, and reputed to be a hybrid between *S. palmata* and *Astilbe japonica*, this probably has nothing to do with either of the plants named, and may, after all, only be a form of *S. Ulmaria.*

S. p. purpurascens (purplish). A form with purplish-tinted foliage.

S. paniculata alba (white-panicled). A synonym of *S. salicifolia paniculata.*

S. pectinata (comb-like). *fl.* whitish; raceme woolly, often compound, somewhat capitate, elongated in fruit. Summer. *l.* rigid, much attenuated and linear at the base, twice or thrice three-cleft; lobes linear, acute. Stems tufted, creeping; branches short, erect, leafy. *h.* 6in. to 12in. North America. Herbaceous perennial. (H. F. B. A. i. 28.)

S. prunifolia flore-pleno (Prunus-leaved, double-flowered).* *fl.* pure white, produced in fascicles along the whole length of the branches. Spring. *l.* small, glabrous, connate at base, and irregularly serrated in the upper half. *h.* 3ft. China and Japan, 1845. One of the most familiar garden plants in the genus. (S. Z. F. J. i. 70.)

S. pubescens (downy). *fl.* white; sepals erect; corymbs hemispherical. March. *l.* ovate-oblong, incised-serrated, pubescent beneath. *h.* 2ft. Mongolia, 1843.

S. pubescens (downy), of Lindley. A synonym of *S. chinensis.*

S. Reevesiana (Reeves'). A synonym of *S. cantoniensis.*

S. reticulata (netted). A synonym of *Astilbe japonica variegata.*

S. rhamnifolia (Rhamnus-leaved). A synonym of *S. vaccinifolia.*

S. salicifolia (Willow-leaved). *fl.* rosy or pink, disposed in terminal, racemose, dense, sub-cylindric cymes. July and August. *l.* oblong-lanceolate, glabrous, from 2in. to 3in. long, equally or

Spiræa—*continued.*

unequally serrated. Stems 3ft. to 5ft. high, stoloniferous. Europe (naturalised in Britain).

S. s. alpestris (alpine). *l.* shorter than those of *S. s. carnea.* Branches very short. A small shrub.

S. s. carnea (flesh-coloured). *fl.* flesh-coloured; panicles consisting of more or less spicate racemes. *l.* lanceolate. Bark of the branches yellowish.

S. s. grandiflora (large-flowered). *fl.* pink, twice as large as those of the type. An ornamental, free-growing shrub. (L. B. C. 1988, under name of *S. grandiflora.*)

S. s. latifolia (broad-leaved). *fl.* white. *l.* ovate-oblong. Bark of the branches reddish.

S. s. paniculata (panicled). *fl.* white, in large, branching panicles. Bark of branches reddish. SYNS. *S. alba* (G. C. n. s., xii., p. 753; W. D. B. 33), *S. paniculata alba.*

S. sorbifolia (Sorbus-leaved). *fl.* white, disposed in a thyrse-like panicle. July and August. *l.* stipuled, pinnate; leaflets sessile, opposite, lanceolate, doubly and sharply serrated. *h.* 3ft. to 6ft. Siberia, 1759.

S. splendens (splendid). A synonym of *S. japonica splendens.*

S. thalictroides (Meadow-rue-leaved). A synonym of *S. hypericifolia thalictroides.*

S. Thunbergii (Thunberg's). *fl.* white, axillary, mostly ternate; ovary free, not inflated. Spring. *l.* exstipulate, linear or linear-lanceolate, attenuated and acute at both ends, mostly argutely serrulated, rarely entire, glabrous on both sides. *h.* 1ft. to 3ft. Japan. (S. Z. F. J. i. 69.)

S. tomentosa (tomentose). *fl.* rose-coloured or rarely white, in short racemes, crowded into a dense panicle. July. *l.* simple, ovate or oblong, serrated; under surface (as well as the stems) very woolly. *h.* 3ft. North America, 1736. (T. S. M. 485.)

S. trifoliata (three-leaved). A synonym of *Gillenia trifoliata.*

S. trilobata (trilobed-leaved). *fl.* pure white; sepals ascending; corymbs numerous, compact, umbel-like. May. *l.* roundish, lobed, crenated, glabrous, reticulately veined. Branches ascending horizontally. *h.* 1ft. to 2ft. Altaian Alps, 1801. A very handsome, low, erect shrub. (W. D. B. 68, under name of *S. triloba.*)

S. Ulmaria (Ulmaria).* Queen of the Meadows; common Meadow-sweet, &c. *fl.* white, ¼in. to ⅓in. in diameter; cymes corymbose, very compound, 2in. to 6in. in diameter, pubescent. June to August. *l.* interruptedly pinnate, white and downy beneath; radical ones 1ft. to 2ft. long; terminal leaflet 1in. to 3in. long, acutely lobed; lateral ones entire, alternate, very small; stipules leafy, half-ovate, toothed. Stems 2ft. to 4ft. high, erect, furrowed. Europe (Britain), &c. Herbaceous perennial. (Sy. En. B. 415.)

S. U. phyllantha (leaf-flowered). *fl.*, sepals distinct, stipitate, transformed into whorled, lanceolate, sharply-serrated leaves; petals and stamens wanting, or, if present, more or less deformed.

S. vaccinifolia (Whortleberry-leaved). *fl.* white, in large, loose, shaggy panicles. July and August. *l.* smooth, ovate, crenate, on long petioles, glaucous beneath. Branches weak, round, downy. *h.* 1ft. to 2ft. Himalaya, 1838. SYNS. *S. laxiflora* (L. & P. F. G. ii. 183), *S. rhamnifolia.*

S. venusta (charming). A garden synonym of *S. lobata.*

S. v. albicans (whitish). A synonym of *S. lobata albicans.*

S. vestita (clothed). *fl.* white, ¼in. in diameter; calyx lobes obtuse; cymes oblong, much-branched, very many-flowered. June. *l.* pinnatisect, sometimes hoary with thick white tomentum beneath; lateral leaflets small or wanting; terminal one 2in. to 6in. in diameter, palmately three to five-lobed, the lobes acutely lobulate and toothed. *h.* 1ft. to 1½ft. Himalayas, 1838. Perennial. (B. R. 1841, 4, under name of *S. kamtschatica himalensis.*)

SPIRAL. Appearing as if wound round an axis.

SPIRANTHERA (from *speira*, a spiral, and *anthera*, an anther; alluding to the spiral anthers). SYN. *Terpnanthus.* ORD. *Rutaceæ.* A monotypic genus. The species is a very handsome, sweet-scented, highly glabrous, stove, evergreen shrub. It thrives in a compost of peat and sandy loam. Propagation may be effected by cuttings of half-ripened wood, inserted thinly in sand, under a glass, which must be occasionally removed in order to prevent them from damping off, which they are otherwise likely to do.

S. odoratissima (very sweet-scented). *fl.* white, showy, sweet-scented, corymbose, axillary and terminal; calyx five-toothed, cup-shaped; petals five, elongate-linear, pubescent, imbricated; disk thick, erect, columnar; stamens five, inserted at the base of the torus. July. *l.* alternate, petiolate, trifoliolate; leaflets gland-dotted, acuminate, entire, glaucous beneath. *h.* 6ft. Brazil, 1823.

SPIRANTHERA (of Hooker). A synonym of **Pronaya** (which *see*).

SPIRANTHES (from *speiros*, a spiral, and *anthos*, a flower; alluding to the spiral inflorescence). Lady's Tresses. SYNS. *Aristotelea* (of Loureiro), *Cyclopogon*, *Gyrostachys*, *Ibidium.* Including *Sarcoglottis*, *Sauroglossum*, and *Stenorhynchus.* ORD. *Orchideæ.* A large genus (about eighty species) of stove, greenhouse, or hardy, terrestrial orchids, broadly dispersed over temperate and tropical regions. Flowers small or rather large, in unilateral or dense, sessile spikes; dorsal sepals and petals erect, connivent or slightly coherent in an upper lip or hood, or the ends alone spreading; lateral sepals free and more spreading, all nearly equal; lip sessile or distinctly clawed, often embracing the terete column by its broad base, spreading at apex, undivided or three-lobed. Leaves variable. Stem leafy, or leafless when flowering. Root-fibres often fascicled on a short rhizome, sometimes thickened into a tuber. The cultivated species are here described. Except where otherwise indicated, stove treatment is necessary. The hardy species thrive in turfy loam, amongst which pieces of chalk or limestone should be mixed; the stove and greenhouse ones succeed in well-drained pots filled with a mixture of turfy loam and fibrous peat, and during the season of rest these latter should be kept rather dry. Propagation is effected by carefully dividing the rootstocks of old plants, just before growth commences.

S. æstivalis (summer). *fl.* and bracts as in *S. autumnalis*, but rather larger; spike slightly pubescent, slender, many-flowered. July and August. *l.* 2in. to 6in. long, narrowed below; lower ones on the flowering stem linear, resembling the radical leaves. Stem 6in. to 18in. high, glabrous. Western Europe (Britain). Hardy. (Sy. En. B. 1473.)

S. australis (Southern). *fl.* generally pink, with a white lip, sessile; lateral sepals obscurely dilated at base, but not saccate; the broad base of the lip quite sessile, or sometimes appearing raised on a very short claw, with a tubercle on each side; spike spiral, very dense or rather loose. June. *l.*, lower ones linear or narrow-lanceolate, 1½in. to 4in. long; upper ones reduced to scales. Stem 6in. to 12in. or more high. Australia, New Zealand, tropical and temperate Asia, extending to some parts of Europe. 1823. Greenhouse. SYN. *Neottia australis.*

S. autumnalis (autumnal). *fl.* white, fragrant, sheathed by the cucullate, cuspidate bracts; lip channelled at the base, the tip exserted, crenate; spike slender. August and September. *l.* 1in. long, in lateral rosettes, ovate, acute, appearing after the flowers. Stem 4in. to 8in. high; upper part and inflorescence pubescent. Europe (Britain), &c. Hardy. (Sy. En. B. 1472.)

S. bicolor (two-coloured). *fl.* greenish, with a white lip; sepals gibbous below the lip; lip complicated, keeled on the back, cucullate at the dilated base; spike loose, spiral, 2in. to 4in. long, densely glandular-pubescent. January. *l.*, lowest rosulate, oblong-lanceolate, acuminate, disappearing before flowering. Stem distantly sheathed with minute leaves. *h.* 1ft. Trinidad, 1823. (B. R. 794, under name of *Neottia bicolor.*)

S. bracteosa (bracteate). *fl.* white and yellow; lateral sepals connate at base; middle lobe of lip three-lobed; bracts linear-lanceolate, leafy, longer than the flowers; spike rarely straight. May. *l.* rosulate, oblong, acute. *h.* 1ft. Brazil, 1835. (B. R. 1934.)

S. cernua (drooping). *fl.* pure white, sweet-scented, pubescent or nearly smooth; lip oblong and very obtuse when outspread (when not so, conduplicate, or the margins much incurved), the callosities at the base prominent; spike cylindrical, rather dense, 2in. to 5in. long. September and October. *l.* linear-lanceolate, the lowest elongated, 4in. to 12in. long. Stem leafy below, 6in. to 20in. high. North America, 1796. Hardy. (B. M. 5277; B. R. 823.) SYN. *Neottia cernua* (B. M. 1568; S. B. F. G. 42).

S. cinnabarina (cinnabar-coloured).* *fl.* yellowish-flesh-coloured, urceolate, slightly tomentose; segments yellowish within, approximating, reflexed at apex; lip whole-coloured; bracts coloured, acute; spike conical, thyrsoid, spirally twisted. June. *l.* lanceolate, sheathing, acute. Stem cylindrical, pale reddish, 2ft. to 3ft. high. Mexico, 1846. SYN. *Stenorhynchus cinnabarinus* (B. R. 1847, 65).

S. colorans (coloured).* *fl.* scarlet, glabrous, ¾in. long, approximate; lip oblong-linear, shortly acuminate; bracts oblong-lanceolate, acuminate, as long as the flowers; spike 2in. to 3in. long. April. *l.* elliptic or elliptic-oblong, acute, 4in. to 6in. long. *h.* 2ft. West Indies and Mexico to Venezuela, 1790. SYNS. *Neottia speciosa* (A. B. R. i. 3; B. M. 1374; H. E. F. 3, 4; L. B. C. 838), *Stenorhynchus speciosus.*

S. c. maculata (spotted). *l.* variegated with bright green spots on a darker ground. 1883.

S. c. Ortgiesii (Ortgies'). *fl.* rose-coloured. *l.* marked with large white blotches. 1873.

Spiranthes—*continued.*

S. elata (tall). *fl.* greenish, ¼in. long; lip linear, blunt, entire; spike elongated, spiral, pubescent, 3in. to 8in. long; scape glabrous, sheathed with clasping-tubular, acuminate scales. July. *l.* rosulate, elliptic or elliptic-oblong, acute, petiolate, 2in. to 6in. long. *h.* 1½ft. to 2ft. West Indies, 1790. SYNS. *Neottia elata* (B. M. 2026; L. B. C. 343), *N. minor* (A. B. R. 376).

S. e. Lindleyana (Lindley's). *fl.* greenish-white, sub-sessile, in pairs, turned to one side; lip dilated, and turned down at the apex with lateral, recurved margins. February. *l.* variegated. Caraccas. This resembles *S. bicolor* and *S. cernua*; from the former it may be distinguished by its much shorter leaves and scape, and from the latter by its broader leaves and blunt lip.

S. Esmeralda (Esmeralda). *fl.* greenish-white, finally yellowish; outer perigone oblique, with glandular hairs outside the sepals; upper sepal ligulate, acute, the lateral ones nearly equal; petals lanceolate, acute, unequal-sided; lip oblong, pandurate or ovate, acute, with two conical, retrorse calli at base; spike spiral, elongated, many-flowered, glandular-hairy; scape above 1½ft. high, with many sheaths. *l.* rosulate, cuneate-oblong, acute, dark green, blotched with white. Brazil, 1862. (Ref. B. 121.) SYN. *S. margaritifera.*

S. euphlebia (veined). *fl.* not numerous, but crowded, horizontal, shortly pedicellate; perianth white, with red and brown veins on the free portions of the sepals and petals, pubescent externally; sepals united in a tube ½in. long; petals semi-lanceolate, erect; scape light greenish-brown. November. *l.* all radical, 5in. to 6in. long, 1½in. to 2in. broad, linear or obovate-oblong. *h.* 1ft. to 1½ft. Brazil, 1882. (B. M. 6690.)

S. grandiflora (large-flowered). A synonym of *S. picta grandiflora.*

S. margaritifera (pearl-bearing). A synonym of *S. Esmeralda.*

S. orchioides (Orchis-like). *fl.* lurid, puberulous; sac produced beyond the adnate portion into a bluntly conical, free spur, one-half the length of the ovary; lip oblong, pointed; spike 3in. to 5in. long. November. *l.* late in appearing, long, broadly lanceolate, pointed. *h.* 2ft. to 3ft. West Indies and Mexico to Brazil, 1826. SYN. *Neottia orchioides* (B. M. 1036; B. R. 701).

S. picta (painted). *fl.* greenish-white or variegated, eight to ten lines long, distant; sepals and petals linear-oblong, the lateral sepals decurrent; lip included, oblong, channelled below the veiny summit, dilated at base; spike 4in. to 6in. long, hairy; scape glabrous below, sheathed with acuminate scales. February. *l.* coetaneous, lanceolate or elliptic-oblong, 4in. to 6in. long, tapering into the petioles. *h.* 1ft. to 2ft. West Indies, &c., 1843. (B. R. 823, under name of *S. cernua.*)

S. p. grandiflora (large-flowered). *fl.*, sepals, petals, and lip greenish within. *l.* almost unspotted. Brazil, Guiana. SYNS. *S. grandiflora* (B. R. 1043), *Neottia grandiflora* (B. M. 2730).

S. p. variegata (variegated). *fl.*, sepals, petals, and lip white within. *l.* variegated. SYNS. *Neottia acaulis* (S. E. B. 105), *N. picta* (B. M. 1562; L. B. C. 214).

S. Romanzoviana (Count Romanzov's). *fl.* white, much larger and broader than in *S. æstivalis*; lip tongue-shaped, contracted below the recurved tip, the tubercles at the base smooth and shining; spike 2in. to 3in. long, stout, glandular-pubescent. August and September. *l.*, radical ones on the flowering stem narrow obovate-lanceolate, 3in. to 6in. long. Stem from 6in. to 10in. high, leafy throughout. Europe (Britain), &c. Hardy. (G. C. n. s., xvi. p. 465; Sy. En. B. 1474, under name of *S. gemmipara.*)

S. Sauroglossum (lizard-tongued). *fl.*, sepals green, broader towards the apex; upper petal agglutinate, the lateral ones arcuate; lip white, parallel with the column, linear, channelled, sessile; bracts subulate; raceme 1ft. or more long, dense, cylindrical; scape nearly 2ft. long, sheathed with distant, leafy scales. April. *l.* radical, oblong-lanceolate, sub-erect, fleshy, not plicate, one-third the length of the scape. Brazil, 1832. SYN. *Sauroglossum elatum* (B. R. 1618). As the genus *Sauroglossum* is merged into *Spiranthes*, and the old specific name of plant here described was pre-occupied, it has been necessary to give a new specific name.

S. Smithii (Smith's). *fl.*, in one variety, yellow, the lip marked with a few green veins; in another, brownish, having a yellowish lip striped with green; peduncle many-flowered. Costa Rica, 1868. This plant is allied to *S. picta.*

S. Weirii (Weir's). *fl.* reddish; raceme elongated, furnished with white, cuspidate bracts. *l.* petiolate, oblong, acute, above dark purple, freely spotted with cream-colour, below purplish. New Grenada, 1870.

SPIRE LILY. A common name for *Galtonia candicans.*

SPIROCONUS. A synonym of **Trichodesma** (which *see*).

SPIRONEMA (from *speira*, spiral, and *nema*, a filament; alluding to the spirally-twisted bundles of vessels contained in the filaments). ORD. *Commelinaceæ.* A monotypic genus. The species is a robust, creeping or stoloniferous, stove, perennial herb, more curious than beautiful. It thrives in any light, rich soil, and may be increased by divisions.

S. fragrans (fragrant). *fl.* white, small, fragrant, in dense, head-like cymes, sub-sessile or very shortly pedicellate, forming a tall, rigid, few-branched panicle; sepals and petals sub-equal, distinct; stamens six, all perfect. May. *l.* large, oblong-lanceolate, sessile, in slightly-imbricated sheaths. Stem leafy, short, thick. *h.* 2ft. Mexico, 1839. (B. R. 1840, 47.)

SPIROSTEMON. A synonym of **Parsonsia** (which *see*).

SPITHAMÆUS. A span long. *See* **Span.**

SPLEENWORT. *See* **Asplenium.**

SPLICE-GRAFTING. Another name for whip or tongue-grafting, the best method of grafting, and one by which plants are very extensively propagated. For details of application, *see* **Grafting.**

SPODO. This term, used in Greek compounds, signifies ash-grey.

SPONDIAS (an old Greek name, used by Theophrastus for the plum, which the fruit of this genus much resembles). Hog Plum; Otaheite Apple. Including *Poupartia.* ORD. *Anacardiaceæ.* A genus comprising about eight species of stove trees, scattered over the tropics. Flowers small, shortly pedicellate; calyx small, deciduous, four or five-cleft; petals four or five, spreading, sub-valvate. Drupes fleshy. Leaves often clustered near the apices of the branchlets, alternate, impari-pinnate; leaflets opposite, often long-acuminate. A selection of the introduced species is given below. They thrive in a compost of loam and sand. Large cuttings will root in sand or mould, in heat.

S. borbonica (Bourbon). *fl.* dark-purple, in axillary and terminal, compound racemes. *l.* with numerous entire, acuminated leaflets. *h.* 40ft. Bourbon and Mauritius, 1825.

S. dulcis (sweet). Sweet Otaheite Apple. *fl.* yellowish-green, in a divaricate panicle. June. *fr.* golden-yellow, with somewhat the flavour of pine-apple. *l.*, leaflets elliptic-oblong, acuminate, repandly crenulated, smooth, with parallel veins. *h.* 50ft. Society Islands, 1793.

S. lutea (yellow). Golden Apple; Jamaica Plum. *fl.* yellowish-white; racemes panicled, often exceeding the leaves. Summer. *fr.* yellow, ovoid, 2in. long, with an agreeable, acid, aromatic flavour. *l.*, leaflets three to eight-jugate, petiolulate, ovate-lanceolate or lanceolate, acuminate, sub-entire or serrulated. *h.* 30ft. West Indies, 1739.

S. purpurea (purple). *fl.* purplish; racemes lateral, simple, few-flowered, much shorter than the leaves. Summer. *fr.* yellow, or tinged with purple. *l.*, leaflets eight to ten-jugate, shortly petiolulate, elliptic-oblong, somewhat blunt, usually serrated. *h.* 30ft. West Indies, 1817.

SPONDYLOCOCCA. A synonym of *Callicarpa.*

SPONGELET and **SPONGIOLE** (diminutives of Sponge). Terms formerly much in use to denote the tips of young rootlets, under the mistaken supposition that they absorbed the plant's food from the soil like a sponge. The formation of new cells in roots goes on (in monocotyledonous plants almost entirely, and in Dicotyledons to effect increase in length) very near the tip, behind the protecting layer, known as the root-cap or *pileorhiza.* The newly-formed cells are very small; and are so closely packed with protoplasm, as to appear very different from the cells in the older part of the root. The latter cells are larger, and more translucent, containing less protoplasm in proportion to their size. The small size of the cells in the tips of the roots, and their abundant contents, rendered it difficult, with the microscopes formerly in use, to make out the structure of this part. It was supposed that they formed a body like a sponge in its power of sucking in fluid from the soil, and the name *Spongiole* was, therefore, given. It is now known that the root-hairs, and not the tips of the roots, absorb the fluid nourishment that plants take in from the soil. *See* **Sap.**

SPONGE-TREE. A name applied to *Acacia Farnesiana.*

SPOONFLOWER. *See* **Labisia.**

SPOONWORT. A popular name for *Cochlearia.*

SPORADIC. Widely dispersed or scattered.

SPORANGIUM and **SPORANGE** (from *spora*, seed, and *aggeion*, a vessel; the latter word is sounded as if spelt *angeion*). Terms used to denote the small vessels or cases in which the spores of Ferns are produced, on the backs of the fronds, in the familiar, little, dark masses called sori. The Sporangia may be exposed on the surface of the fronds from their origin (*e.g.*, in Polypodies), but are usually protected, more or less completely, under a membrane or indusium. Each Sporangium is supported on a rather slender stalk in most Ferns; but in a few they are attached without a stalk. In the Tribe *Marattieæ* they may be partly joined to one another, and among *Ophioglosseæ* they are sunk in the substance of the modified fertile frond. In most Ferns, they are formed of a single layer of cells, which are thin-walled, with the exception of a single row of thicker-walled cells, known as the annulus, which runs over the top of the Sporangium, or around it horizontally, or forms a cap on the top. Whatever its position, the annulus, by its resistance to pressure, causes the ripe Sporangium to split in a definite place. The spores in the other Orders of Vascular Cryptogams also are contained in Sporangia; and the same term is employed for corresponding structures among the Cellular Cryptogams; but for the peculiarities of their structure in these groups the reader must refer to works on Systematic Botany, as these peculiarities are of no special interest in gardening.

SPORE (from *spora*, seed). The name given to those bodies in Cryptogams that reproduce the species, and from which young plants grow. Some Spores resemble the seeds of Phanerogams, or flowering plants, in being produced sexually; but they differ in the Spore never inclosing an embryo or young plant, as the seed does. The Spore, in fact, corresponds to the embryo itself, rather than to the entire seed. But, in addition to these sexual Spores, most Cryptogams produce others asexually from single cells, by a process of budding, or of cell division. These asexual Spores may very closely resemble the sexual in appearance; but they are often very different, and frequently a plant bears two or three varied forms of asexual Spores, produced, it may be, under different conditions as regards food, temperature, and environments. They often receive special names, *e.g.*, Conidia, Sporidia, Stylospores, Zoospores, and so forth among Fungi; and Stylospores, Tetraspores, &c., among Algæ. For a fuller account of the forms assumed by Spores among Fungi, *see* **Mushrooms, Oidium, Peronospora, Pleospora** and **Puccinia**; and for a description of the life-cycle of the higher Cryptogams, and of the part played by Spores in the cycle, *see* **Mosses** and **Prothallus.**

SPORIDIUM. The same as, or a diminutive of, **Spore** (which *see*).

SPORIFEROUS. Spore-bearing.

SPOROBOLUS (from *sporos*, a seed, and *bolus*, a casting; the seeds are loose and easily scattered). SYNS. *Agrosticula, Cryptostachys, Triachyrum, Vilfa.* Including *Agrostis* (in part). ORD. *Gramineæ.* A rather large genus (about eighty species) of greenhouse or hardy, annual or perennial grasses, of variable habit, broadly dispersed over the temperate and warmer regions of the globe, being numerous in America, and few in Europe and Russian Asia. Spikelets small, one, or rarely two, flowered; glumes three, membranous; panicle spike-formed or sometimes elongated and very slender. Leaves flat or

Sporobolus—*continued.*

convolute-terete. A few of the species have been introduced, but none are of much value from a garden standpoint.

SPORT. A bud-variation or seed-variation.

SPRAGUEA (named in honour of Isaac Sprague, an American botanical draughtsman). ORD. *Portulaceæ.* A monotypic genus. The species is a half-hardy, dwarf perennial herb, of novel character. It is well adapted for planting on the rockwork, or in the edges of flower borders; any ordinary soil will prove suitable. Propagated by cuttings; or by seeds, sown in a cold frame, in spring.

S. umbellata (umbelled). *fl.* densely imbricate-spicate; sepals two, whitish, persistent, large, scarious; petals four, rosy-lake, just protruding; anthers purple; umbel terminal, compound, many-rayed. July. *l.*, radical ones rosulate, spathulate, slightly fleshy; cauline ones smaller, alternate. California, 1858. (B. M. 5143.)

SPRAY. A floral head-dress, worn on the side of the head, either composed of various flowers or of one branch or shoot, when specially suited for the purpose. The water from a syringe, when broken into very fine particles, is often called Spray.

SPREAD EAGLE. A common name for *Oncidium carthaginense.*

SPREKELIA (so called after J. H. Sprekelsen, of Hamburg, who wrote on liliaceous plants, and died in 1764; from him Linnæus received *S. formosissima*). ORD. *Amaryllideæ.* A genus of two species of greenhouse or half-hardy, tunicated-bulbous plants, requiring culture similar to **Amaryllis** (which *see*).

S. Cybister (Cybister). Tumbler Sprekelia. *fl.* reflexed; perianth red below, somewhat greenish above, the segments broad below, pale-striped within, long-narrowed above; filaments very long, reddish towards the base; peduncles above 1in. long; scape strong, sub-terete, upwards of 2ft. high, sanguineous below, four-flowered. April. *l.* appearing after the flowers, 1¼in. broad, reddish in the centre towards the base. Bolivia, 1840. A very remarkable plant. (B. M. 3872.)

S. formosissima (very beautiful).* Jacobea Lily. *fl.* crimson or white, large and showy, pedicellate, in a spathe-like bract; perianth very declinate, without any tube, the segments scarcely unequal; stamens affixed at the base of the segments; scape fistular. June. *l.* late in appearing, loriform-linear. *h.* 2ft. Mexico, 1658. (S. B. F. G. ser. ii. 144.) SYNS. *S. glauca* (B. R. 1841, 16), *Amaryllis formosissima* (B. M. 47).

S. glauca (glaucous). A synonym of *S. formosissima.*

SPRENGELIA (named in honour of Christian Conrad Sprengel, of Brandenburgh, 1750-1816, who published, in 1793, a celebrated work on the fertilisation of flowers). SYNS. *Poiretia* (of Cavanilles), *Ponceletia.* ORD. *Epacrideæ.* A small genus (three species) of elegant little, erect or prostrate, glabrous, greenhouse shrubs, confined to extra-tropical East and South Australia. Flowers solitary and terminal, many-bracted; calyx of five sepals; corolla as long as, or scarcely exceeding, the calyx; lobes five, spreading, imbricated; stamens short, hypogynous. "Leaves with a shortly sheathing, often membranous base, completely covering the branches, very concave and stem-clasping immediately above the base, acute or acuminate, with a spreading point, finely veined or almost veinless, the upper ones passing into floral leaves or bracts, the sheathing bases of the stem leaves deciduous with them, leaving the denuded stem without scars" (Bentham). Two of the species have been introduced. These are best raised from seeds when they can be obtained, and grown on in firmly pressed, well-drained pots of sandy peat. Cuttings should be treated like those of *Epacris.*

S. Andersoni (Anderson's). A synonym of *Andersonia sprengelioides.*

S. incarnata (fleshy).* *fl.* pink; sepals coloured; corolla equalling the calyx, the petals almost free, the very short claws valvate and slightly cohering. May. *l.* ¼in. to ½in. long, tapering to a spreading or recurved point; floral ones similar, but smaller. *h.* 2ft. 1793. (L. B. C. 262; B. M. 1719.)

Sprengelia—*continued.*

S. Ponceletia (Ponceletia).* *fl.* scarlet; sepals leaf-like, but more lanceolate; corolla about as long as the calyx, the very short tube not separating into petal claws, the lobes much longer. May. *l.* broad, concave, spreading or incurved, acuminate and pungent-pointed, two to four lines long. *h.* 1ft. 1826. SYN. *Ponceletia sprengelioides.*

SPRENGELIA (of Schultes). A synonym of **Melhania** (which *see*).

SPRING BEDDING. A style of bedding in which hardy plants play a conspicuous part, along with various bulbs. In late springs, it is not an unfrequent occurrence, when the same beds are to be occupied with the ordinary tender subjects for a summer display, that, just at the time for planting the latter, the spring flowers are about at their best; this must, therefore, be anticipated, if the same beds are to be used for both sets of plants, or Spring Bedding must be carried out in a separate part of the garden. Early-flowering species and varieties of *Crocus*, also Daffodils, Hyacinths, and Tulips, will be past flowering before the middle of May, the season when summer flower-beds are required; but their foliage will rarely have ripened by that time, and, consequently, if the bulbs are of material value for another season's display, it would not be advisable to disturb them. Hardy plants, for Spring Bedding, have to be prepared in a reserve garden or border, for transferring, some time during September and October, to the positions where they are intended to flower. Many that are well adapted for the purpose are only of annual duration, and these should be raised from seeds, sown in the reserve ground, not later than about the middle of July, the young plants being transplanted and grown on afterwards.

Amongst hardy annuals, used for Spring Bedding, *Silene pendula*, and its variety *compacta*, are indispensable. Other valuable plants for the purpose, mostly perennials, are the following; they are generally of very easy culture: *Alyssum saxatile; Antennaria tomentosa*, suitable for an edging; *Arabis albida; Aubrietia*, in variety; Daisy, several double forms; *Iberis*, perennial species; *Myosotis dissitiflora*, and other species of Forget-me-not; *Phlox*, dwarf forms or varieties of *P. subulata*, &c.; *Polyanthus* and hardy Primroses, in great variety; *Pyrethrum* (Golden Feather); hardy Sempervivums; early-flowering Violas and Wallflowers. In the last-named, the chief colours represented are blood-red and golden-yellow.

SPRING-BEETLES. A name given to the insects that produce the dreaded **Wireworms** (which *see*). The name is derived from the power possessed by these beetles (*Elateridæ*), when laid on their backs on a hard surface, of leaping a few inches into the air. This power is due to a peculiar mechanism on the back between the thorax and abdomen. It enables the insects to turn over, which they would not otherwise do, because of the shortness of their legs. This habit has also gained for them the popular names of Skipjacks and Snap Beetles.

SPRING BELL. A common name for **Sisyrinchium grandiflorum** (which *see*).

SPRING GRASS. A common name for **Anthoxanthum** (which *see*).

SPRINGIA. A synonym of **Ichnocarpus** (which *see*).

SPRING SNOWFLAKE. A common name for **Leucoium vernum** (which *see*).

SPRING USHER MOTH. *See* **Hybernia.**

SPRING-WEEVILS. A group of Weevils which possess powerful thighs, especially in the last pair of legs, and are thus able to leap several inches. *See* **Orchestes.**

SPRUCE FIR. A term applied to *Dacrydium cupressinum*, several species of *Picea*, &c.

SPRUCE-GALL APHIS (*Chermes Abietis*). The maker of curious galls on the young twigs of Spruce-trees, especially in crowded plantations. In such situations, Spruces are often loaded with the galls of this insect. They resemble young cones or miniature pine-apples, whence they are often called Spruce Pine-apple Galls. When situated at the tips of young branches, they are usually quite regular in form; but when the base of the twig is affected, the Gall, though generally larger than when near the tip, is often confined to one side of the twig, which becomes much swollen, while the other side remains stunted. When full-grown, the Galls vary from ¾in. to 1½in. in length, by about two-thirds as much in breadth, and consist of the swollen, overlapping bases of the leaves of the twig, which assume the appearance of scales, frequently prolonged into short, green tips. The galls are often red, but may be yellowish or pale green, according to exposure to, or absence of, light. While fresh, they are fleshy in texture; but, after a time, the scales gape apart, exposing numerous cavities between their bases, and become woody and brown. In this condition they frequently remain for months, or even for years, on the trees, the branches of which are often loaded with such dry galls, the growth of several previous years.

The gall-makers are Aphides, belonging to the genus *Chermes*, distinguished from most of the Aphides by the short, stout antennæ, the absence of honey-tubes, and the simple, unbranched veins in the fore wings. The species is *C. Abietis*, sometimes known also as *Adelges Abietis*. The insects vary a good deal, according to their stage of development and their sex. The originators of the galls are wingless, viviparous females, which are very small, ochreous-yellow (with green or purple shades and green legs), woolly, and oval. These females hybernate on the branches; and in spring each fixes herself near the base of a bud when it begins to grow, and, pushing in her beak, she thus at the same time obtains her own food, and, by the irritation she causes, gives rise to the swelling of the young leaves that form the gall. Between the swollen leaves are cavities, in one of which she is sheltered; and here she lays numerous eggs, which are covered with the woolly coating of her body. The larvæ soon emerge from the eggs. They spread over the gall, and, by the irritation their suction causes, increase the size of the gall, the scale-leaves overlapping and covering them, in the opinion of some observers; whilst others believe that the larvæ creep, through minute slits, into pre-existing cavities between the scales. In the cavities they become pupæ, and about June and July winged females are numerous. These are much larger than the wingless females, and are yellowish-green or golden-brown, with short, green legs, and horizontally-folded, broad wings. The males are very rare; they are very small, and wingless. The winged females soon scatter themselves over the trees, and lay eggs, from which, in due time, the wingless females are again developed.

Remedies. The best, where applicable, is to pick off and destroy the galls while young, before the insects have spread from them over the plants. Badly-infested trees or branches should be burned without delay. The galls should not merely be thrown on the ground, as they contain enough sap to permit of the insects coming to maturity in them after their removal from the trees. Overcrowding, deficiency of air and light, and bad drainage, greatly increase the risk to the trees of injury from these galls; hence, judicious thinning, draining damp soils, and, in fact, whatever tends to strengthen the trees, are all useful preventives of injury.

SPRUCE PINE-APPLE GALL. *See* **Spruce-Gall Aphis.**

SPRUE. A market name for the smallest sprouts of *Asparagus*.

SPUMESCENT, SPUMOSE. Froth-like in appearance.

SPUR. A hollow, terete extension of some part of a flower, usually nectariferous; *e.g.*, the calyx of Larkspur and the corolla of Violet. The term is rarely applied also to a solid spur-like process.

SPURGE. *See* **Euphorbia.**

SPURGE FLAX. An old name for *Daphne Mezereum*, and other species.

SPURGE LAUREL. *See* **Daphne Laureola.**

SPURGE NETTLE. A common name for *Jatropha urens*.

SPURGE OLIVE. A popular name for *Cneorum tricoccum* and *Daphne Mezereum*.

SPURGEWORTS. Lindley's name for the *Euphorbiaceæ*.

SPURS, SLIPPER. *See* **Pedilanthus.**

SPYRIDIUM (from *spyris*, a basket, and *eidos*, resemblance; in allusion to the shape of the calyx). ORD. *Rhamneæ*. A genus comprising twenty-five species of greenhouse, Australian shrubs. Flowers sessile in heads or rarely solitary, surrounded by small, brown bracts; calyx five-lobed; petals five, hood-shaped, usually inclosing the anthers; stamens five; heads small, sessile, usually several together in a compound head or in corymbose cymes. Leaves usually small. Only one species has been introduced to gardens. It thrives in a compost of peat and sandy loam. Propagation may be effected by cuttings of the half-ripened shoots, cut to a joint, dried at the base, and inserted in sand, under a glass.

S. globulosum (globulose). *fl.-heads* nearly globular, numerous, in dense, corymbose cymes in the axils of the leaves, and not much exceeding them. *l.* ovate, obovate, or oblong, very obtuse, 1in. to 1½in., or rarely 2in., long, glabrous above, white or hoary beneath, or rarely slightly rusty. 1874. A tall shrub. (R. G. 795.)

SQUAMA. A scale, usually the homologue of a leaf.

SQUAMATAXUS. A synonym of *Saxegothea*.

SQUAMATE, SQUAMIFEROUS, SQUAMOSE. Scaly; covered with small, scale-like leaves.

SQUAMELLA, SQUAMULA. A diminutive or secondary scale.

SQUAMIFORM. Scale-like.

SQUAMULOSE. Beset or covered with minute scales.

SQUARROSE. When bodies are rough with spreading and projecting processes. Imbricated scales, bracts, or leaves are said to be Squarrose when their tips are pointed and very spreading or recurved.

SQUARRULOSE. Minutely squarrose.

SQUASH. A name applied to several species of *Cucurbita*.

SQUILL. *See* **Scilla.**

SQUILLA. Included under **Urginea** (which *see*).

SQUILL, ROMAN. A popular name for *Bellevalia*.

SQUILL, STRIPED. A common name for *Puschkinia scilloides*.

SQUINANT. An old name for *Andropogon Schœnanthus*.

SQUIRREL-TAIL GRASS. A popular name for several species of *Hordeum*.

SQUIRTING CUCUMBER. *See* **Ecballium Elaterium.**

STAAVIA (named after Martin Staaf, a correspondent of Linnæus). ORD. *Bruniaceæ*. A genus comprising about half-a-dozen species of greenhouse shrubs, resembling Heaths or Epacrises, and confined to the Cape of Good Hope. Flowers small, collected into terminal, disk-like heads, involucrated by numerous, mostly shining, whitish bracts, which are either longer or shorter than the leaves; petals free. Leaves small, erecto-patent or recurved, linear or acicular. The following is the best-known of the few species which have been grown in this country. It thrives in sandy peat, and may be propagated by cuttings of the young wood, inserted in sand, under a glass.

S. glutinosa (glutinous). *fl.* white, agglutinated with resinous juice; heads usually solitary, the size of a cherry; bracts of involucre whitish, greenish at base, ½in. long, with a black mucro. April. *l.* approximate, erect or spreading, from six to eight lines long, linear, trigonal, obtuse, callous, and, as well as the branches, quite smooth. *h.* 3ft. or more. 1793. (L. B. C. 852.)

STACHYOPOGON. A synonym of *Aletris*.

STACHYS (the ancient Greek name used by Dioscorides for this genus or for some similar plants, and derived from *stachys*, a spike; alluding to the spicate inflorescence). Hedge Nettle; Woundwort. SYNS. *Betonica, Eriostomum, Galeopsis* (of Mœnch), *Tetrahitum, Trixago, Zietenia*. ORD. *Labiatæ*. A large genus (nearly 200 species have been described, but probably not more than 160 are really distinct) of greenhouse or hardy, tall perennial or diffuse annual herbs, rarely sub-shrubs or small shrubs, broadly dispersed, but chiefly inhabiting North temperate and Oriental regions. Flowers purplish, scarlet, pale, yellow, or white, rather small or sometimes showy, sessile or very shortly pedicellate; calyx tubular-campanulate, five-toothed; corolla cylindric, with usually a ring of hairs inside, often incurved above, not, or scarcely, dilated at throat; upper lip of limb erect or spreading; lower one longer, spreading, three-lobed, the mid-lobe largest; stamens four; whorls two to many-flowered, axillary or clustered in terminal spikes. Nutlets ovoid or oblong. Leaves entire or toothed; floral ones conformed or reduced to bracts. *S. arvensis* (Field Betony), *S. Betonica, S. germanica, S. palustris* (Clown's All-heal), and *S. sylvatica*, are included in the British Flora. The species, some of which have a rather weedy appearance, will thrive in any ordinary garden soil; they may be increased by seeds, or by divisions. A selection of those best known in gardens is given below; except where otherwise indicated, they are hardy, herbaceous perennials.

S. albicaulis (white-stemmed). *fl.*, calyx loosely ten-nerved; corolla violet, glabrous, twice as long as the calyx; whorls six-flowered, remote; racemes elongated, slightly branched. Summer. *l.* remote, 1in. to 3in. long, the lower ones petiolate, the upper ones sessile, all lanceolate, deeply toothed, rounded-cuneate or narrowed at base. Stem branched, 2ft. to 3ft. high, white-woolly at base. Chilian Andes. (B. R. 1558.)

S. alpina (alpine). *fl.*, calyx teeth acute, spiny; corolla purplish or fuscous-red, woolly outside, scarcely twice as long as the calyx; whorls remote, many-flowered. Summer. *l.* petiolate, ovate, obtuse or slightly acute, crenate-serrate, cordate at base, villous, scarcely wrinkled. *h.* several feet. South Europe. A very variable plant.

S. a. intermedia (intermediate). *l.* more wrinkled, and sometimes slightly woolly beneath. A large form. (S. B. F. G. 100, under name of *S. sibirica*.)

S. angustifolia (narrow-leaved). *fl.* shortly pedicellate; corolla purplish, glabrous or slightly pubescent, the tube shortly exserted; whorls remote, two-flowered; racemes over 1ft. long, nearly simple. July. *l.* linear, entire, serrated, or the lower ones pinnatifid, all acute at apex. Branches twiggy, diffuse, several feet long. *h.* 9in. Tauria, 1823. Hardy sub-shrub. (S. B. F. G. 180.)

S. arenaria (sand-loving). *fl.*, calyx four lines long; corolla purplish, pilose outside, twice as long as the calyx; whorls loosely six to ten-flowered, remote; racemes loose, ascending, nearly 1ft. long. July. *l.* sub-sessile, oblong-linear or lanceolate, 1in. to 1½in. long, acute, slightly serrated, long-narrowed

Stachys—*continued.*

towards the base, entire. Levant, 1804. Plant decumbent. (B. M. 1959.)

S. aspera (rough). *fl.* sessile or nearly so; corolla purple or rose-red, glabrous throughout; spikes usually much interrupted. Summer. *l.* oblong-ovate to oblong-lanceolate, 1½in. to 4½in. long, acute or acuminate, rather obtusely serrated, nearly all distinctly petiolate, and truncate or merely sub-cordate at base. *h.* 2ft. to 4ft. North America and Japan. Plant sparsely hirsute or hispidulous-pubescent. (L. B. C. 1412.)

S. Betonica (Betony). Bishop's-wort; Wood Betony. *fl.*, calyx lobes spinescent; corolla red-purple, hairy, ¾in. long, the tube exserted; whorls in an oblong, long-peduncled spike, 1in. to 3in. long. June to August. *l.* petiolate, oblong-cordate, obtuse, 1in. to 4in. long, deeply crenate; cauline ones few, much narrower than the radical ones. Stem 6in. to 2ft. long, ascending or erect. Europe (Britain). This plant was formerly much used in medicine. (Sy. En. B. 1067) SYN. *Betonica officinalis.*

S. coccinea (scarlet).* *fl.* generally distinctly pedicellate; corolla scarlet-red, with a narrow, cylindrical tube twice or thrice as long as the calyx; spike interrupted. Summer. *l.* ovate-lanceolate with a cordate base, or oblong-deltoid, obtuse, crenate, 1in. to 2in. long; cauline ones slender-petiolate; floral ones sessile. *h.* 1ft. to 2ft. Texas to Arizona and Mexico, 1798. Greenhouse herbaceous perennial. (A. B. R. 310; B. M. 666; P. M. B. viii. 101.)

S. densiflora (dense-flowered). *fl.*, calyx teeth spiny; corolla flesh-coloured, twice as long as the calyx, villous outside, the tube incurved; spike dense, thick, 1½in. to 2in. long. June. *l.* petiolate, ovate-oblong, obtuse, 2in. to 3in. long, crenate, wrinkled, cordate at base; lower floral ones constantly ovate and scarcely sessile. Stem erect, 1½ft. high, nearly simple. South Europe, 1759. Plant hairy. (B. M. 2125, under name of *Betonica incana.*) SYN. *Betonica hirsuta.*

S. germanica (German).* *fl.*, calyx teeth longer than the tube; corolla pale pink, variegated with white, ½in. long; whorls four to six-flowered. April to November. *l.* coarsely crenate-serrate, often cordate; radical ones 2in. to 5in. long, rather long-petiolate; cauline ones shortly petiolate, ovate-oblong or lanceolate. Stem 1ft. to 3ft. high, very stout, branched. Europe (Britain). A shaggy biennial. (B. R. 1289; F. D. 684; J. F. A. 319; Sy. En. B. 1068.)

S. grandidentata (large-toothed). *fl.*, calyx teeth somewhat spiny; corolla violet, glabrous, twice as long as the calyx; whorls six-flowered, remote. Summer. *l.* petiolate, oblong-lanceolate, deeply toothed, all rounded-cuneate or narrowed at base; floral ones shorter than the calyx. Stem erect, 1ft. to 3ft. high. Chili. (B. R. 1080.)

S. grandiflora (large-flowered).* *fl.*, calyx six to seven lines long, purplish at apex, villous; corolla of a beautiful violet, twelve to fourteen lines long, glabrous; whorls many-flowered, distinct, the lower ones remote. May. *l.* petiolate, broadly ovate, obtuse, crenate, broadly cordate at base, wrinkled, villous; floral ones sessile. Stem 1ft. high. Siberia, 1800. (B. M. 700, under name of *Betonica grandiflora.*)

S. inflata (inflated). *fl.* sessile; calyx ⅓in. long, white-tomentose; corolla red, slightly silky outside, half as long again as the calyx; whorls distant, about six-flowered. July. *l.* sub-sessile, oblong, obtuse, entire, scarcely 1in. long, white-tomentose or woolly on both sides. Branches elongated, clothed with slightly floccose tomentum. *h.* 1½ft. Persia, 1852. Hardy sub-shrub. (B. R. 1697.)

S. lanata (woolly).* *fl.* striped; whorls many-flowered, the upper ones approximating in a spike. July. *l.* very thick and soft, oblong-elliptic, narrowed at both ends, scarcely crenulate, wrinkled. Stem 1ft. to 1½ft. high, clothed (as well as the leaves and calyces) with dense wool. Tauria, 1782.

S. Maweana (Mawe's).* *fl.*, calyx ¼in. long, woolly; corolla pale straw-colour, with purple blotches on the lower lip, ½in. long and broad; whorls collected into a narrow-oblong, leafy spike. July. *l.* spreading, about 1in. long, ovate-cordate, sub-acute, deeply crenate-toothed, grey-green above; petioles of the cauline leaves longer than the blades. Branches 1ft. or more high. Morocco, 1878. Whole plant clothed with silvery-white hairs. (B. M. 6389.)

S. Salviæ (Salvia-like). A synonym of *Sphacele Lindleyi.*

S. sibirica (Siberian). A synonym of *S. albicaulis intermedia.*

STACHYS. This term, used in Greek compounds, denotes a spike: *e.g.*, *Phyllostachys, Stachytarpheta, Stachyurus.*

STACHYTARPHA. A synonym of **Stachytarpheta** (which *see*).

STACHYTARPHETA (from *stachys*, a spike, and *tarphys*, thick; alluding to the form of the inflorescence). Bastard Vervain. SYNS. *Abena, Cymburus, Stachytarpha.* ORD. *Verbenaceæ.* A genus consisting of about forty species of pilose, villous, or glabrous, stove herbs, sub-shrubs, or shrubs, natives of tropical and sub-tropical America, one being also broadly dispersed over tropical

Stachytarpheta—*continued.*

Asia and Africa. Flowers white, blue, purple, or scarlet, solitary in the axils of the bracts, sessile or half-immersed in the rachis of the spike; calyx five-toothed; corolla tube straight or incurved, the limb of five broad, spreading, obtuse or retuse lobes, equal or variously unequal; perfect stamens two; bracts sometimes small or narrow, appressed or loose, sometimes ovate or lanceolate, imbricated; spikes terminal. Leaves opposite or alternate, toothed, often wrinkled. All the species thrive in a soil composed of sandy loam and leaf mould. The shrubs may be propagated by cuttings, inserted in sand, under a hand glass, in bottom heat; the perennials may be multiplied by divisions, and the annuals by seeds. The best species, from a garden standpoint, are described below. *S. mutabilis* is a handsome, perpetual-flowering sub-shrub, the leaves of which have been imported from South America for the purpose of adulterating tea.

S. aristata (awned). *fl.* rich deep blackish-purple, in a very long, terminal spike, clothed with numerous leafy bracts, tapering suddenly into a long subulation; corolla tube curved. October. *l.* opposite, ovate or rhomboid-ovate, acute, coarsely serrated, entire at base, tapering towards the base into short footstalks, wrinkled. *h.* 2ft. South America, 1845. Sub-shrub. (B. M. 4211; F. d. S. 55.)

S. bicolor (two-coloured). *fl.* at first purple, gradually becoming pale greenish-blue, the throat of the long, funnel-shaped corolla remaining white; spike terminal, slender, exceeding the leaves; bracts subulate, erect. June. *l.* varying from ovate to ovate-lanceolate, acute, serrated from a little above the base. *h.* 3ft. Brazil, 1865. Shrub. (B. M. 5538.)

S. cayennensis (Cayenne). *fl.* blue, sunk in furrows of the rachis; bracts linear, acuminate, bristly above; spikes slender. May. *l.* ovate, blunt or bluntish, contracted into the petioles. *h.* 3ft. Cayenne, 1822. Shrub.

S. crassifolia (thick-leaved). *fl.* azure-blue; bracts hard, ovate; spikes long, slender, terete, straight, glabrous. June. *l.* 2in. to 3in. long, elliptic or oblong-obovate, entire at base, coarctate, sessile, obtuse, crenate-serrate, the margins revolute, pubescent-tomentose beneath. *h.* 2ft. Brazil, 1826. Shrub.

S. dichotoma (dichotomously-branched). *fl.* blue; bracts very narrow; spikes slender, 6in. to 18in. long. June. *l.* 2in. to 4in. long, ovate or ovate-oblong, coarctate at base, cuneate-decurrent, acute or acuminate, deeply crenate-serrate. Branchlets tetragonal. *h.* 2ft. South America. A dichotomously-branched sub-shrub. (B. M. 1848, under name of *S. urticifolia.*)

S. jamaicensis (Jamaica). Brazilian Tea-tree. *fl.* blue, sunk in deep excavations of the thickened rachis; bracts appressed; spikes about as thick as a goose-quill, 6in. to 10in. long. July. *l.* oval or oblong, coarsely serrated, tapering into the petioles. *h.* 2ft. West Indies, 1714. Annual, but suffrutescent at base. (B. M. 1860.)

S. mutabilis (changeable).* *fl.* crimson, at length rosy, large, sunk in furrows of the rachis; bracts lanceolate-subulate, spreading above the middle; spikes elongated, erect. All the year. *l.* ovate, contracted into the petioles, scabrous above, pubescent beneath. *h.* 3ft. South America, 1801. Sub-shrub. (A. B. R. 435; B. M. 976; R. G. 90.)

S. urticifolia (Nettle-leaved). A synonym of *S. dichotoma.*

STACHYURUS (from *stachys*, a spike, and *oura*, a tail; in allusion to the shape of the catkins). ORD. *Ternströmiaceæ.* A genus consisting of only two species of half-hardy, glabrous shrubs or small trees, one being Japanese, the other Himalayan. Flowers small, disposed in short, lateral or axillary racemes or spikes; sepals four, closely imbricated; petals four, free, imbricated; stamens eight, free. Leaves serrated, membranous. *S. præcox* is a shrub or small tree, producing its flowers in great profusion before the leaves are unfolded. It thrives in any common garden soil, but except in the south-western counties, requires the shelter of a wall. The plant may be readily propagated by means of cuttings of the half-ripened wood, inserted in sandy soil, under a bell glass, in a greenhouse, and kept shaded until roots are formed.

S. præcox (precocious).* *fl.* yellowish-green, ⅓in. in diameter, sub-globosely campanulate, sessile or very shortly pedicellate; petals much larger than the sepals; spikes axillary, 2in. to 3in. long, curved, shortly pedunculate, many-flowered. March. *l.* 4in. to 6in. long, obovate or ovate-lanceolate, acuminate, serrulated, often oblique, thin, bright green. Branches slender, flexible. *h.* 10ft. Japan, 1864. See Fig. 518, p. 484. (B. M. 6631; R. H. 1869, 200; S. Z. F. J. 18.)

STACKHOUSIA (named after John Stackhouse, 1740-1819, a British botanist, who wrote on *Algæ*). The only genus of ORD. *Stackhousieæ* (which *see* for characters). The species best known to cultivation is described below. It thrives in ordinary soil, and may be increased by cuttings of the young shoots, inserted in sandy soil, in a cold frame.

S. linariæfolia (Toadflax-leaved). A synonym of *S. monogyna*.

S. monogyna (one-styled). *fl.* white; corolla tube three to four lines long; racemes at first dense, but often lengthening out to 4in. or 5in. April. *l.* linear or lanceolate, acute or obtuse, crowded, or few and distant, ½in. to 1in., or, in very luxuriant specimens, 2in. long. Stems slender, simple or slightly branched, 1ft. to 1½ft. high. Hardy perennial. SYN. *S. linariæfolia.*

STACKHOUSIEÆ. A small natural order of herbs, usually forming a perennial stock, with erect, slightly branched, twiggy stems, often assuming a yellowish colour, rarely dwarf and tufted; they are almost endemic in Australia, one species extending to New Zealand, and another to the Philippine Islands. Flowers white or yellow, in terminal spikes, rarely solitary, three-bracted at base; calyx small, five-lobed or five-cleft; petals five, perigynous, with elongated claws, usually free at the base, but united upwards in a tubular corolla, with spreading lobes; stamens five, included in the corolla tube, of very unequal lengths. Leaves alternate, narrow, entire, often somewhat fleshy; stipules none, or when present very minute. The order *Stackhousieæ* is limited to a single genus—*Stackhousia*—comprising about twenty species.

STÆHELINA (named after Benedict Stæhelin, 1695-1750, a Swiss botanist). ORD. *Compositæ*. A genus consisting of half-a-dozen species of hardy or half-hardy sub-shrubs, natives of the Mediterranean region. Flower-heads purplish, narrow, solitary or densely corymbose; involucral bracts in many series, acute or obtuse; receptacle flat; achenes glabrous or silky-villous. Leaves alternate, entire or sinuate-toothed, white-tomentose beneath. Two species, *S. arborescens* and *S. dubia*, have been introduced, but they are probably not now cultivated.

STAFF-TREE. A common name for **Celastrus** (which *see*).

STAG BEETLES. *See* **Lucanus cervus.**

STAGES. In greenhouses and other glass structures, Stages are erected on which to stand plants that are grown in pots. They are generally constructed of wood, but are much more substantial when the uprights are made of iron, and the shelves of slate. If plants are found to get dry too frequently on slate Stages, it is an easy matter to spread a little fine ashes, spar, or shell, over the surface, beneath the pots, for retaining moisture.

Step-stages are those made so that one shelf is situated above the other, in a similar way to stairs; they are frequently preferred for the centre of a span-roofed greenhouse, or for the back part of a lean-to structure. The shelves in Step-stages are best made of battens, which may be fixed at any distance apart, according as the plants intended to be stood upon them are in medium-sized or small pots.

STAG'S-HORN FERN. A popular name for several species of *Platycerium.*

STAG'S-HORN SUMACH. A common name for **Rhus typhina** (which *see*).

STAKES AND STAKING. Stakes, in various sizes, are indispensable in gardens, both for supporting plants in pots, and also in the open ground. For the first-named purpose, those made from deal are the best; they may be purchased, ready for use, in a great variety of lengths and sizes, or cut out of ordinary laths of double thickness. Small annual growths of Hazel, which grow in great quantities from the base of established bushes, are valuable as Stakes for young plants that are being grown on; also prunings of fruit-trees, when appearances are immaterial. Strong Stakes, for fruit and ornamental trees, Raspberries, &c., are best selected from a plantation where the common Ash predominates, as this wood generally grows tolerably upright, and lasts a long time in use. Hazel, of moderate size, is also largely employed for Stakes, when required for packing, as, in a green or partially green state, it bends readily if required. Several other kinds of wood may also be selected, and made to answer their purpose, as Stakes.

The value of Staking, in connection with newly-planted trees, cannot be over-estimated, as, when properly executed, it prevents the trees from rocking about when the wind blows. When a single Stake is likely to be needed for permanently supporting a tree, it should be inserted at the time of planting; otherwise, it may very likely be driven in just where the best roots are situated, and thereby cause much injury. Plants that are likely to take care of themselves at the end of a year, are rendered safe for that period by placing three

FIG. 518. FLOWERING BRANCHLET OF STACHYURUS PRÆCOX (see page 483).

Stakes and Staking—*continued.*

Stakes, in the shape of a triangle, round them, just clear of the roots, and tying to each near the top. A small piece of carpet, or something soft, should be put round the stem where the ties are made, for protecting the bark.

All Stakes must of necessity be sharpened more or less to a point, at the lower or larger end, in order that they may enter the ground.

STALAGMITES. A synonym of **Xanthochymus** (which *see*).

STALK. A common term for any kind of lengthened support on which an organ is elevated.

STAMEN (from *stamen*, a thread; in allusion to the slender form). One of the male organs of flowers. In the Stamens the pollen is formed and ripened, before it is set free to fall on the stigma, and, through it, to gain access to and fertilise the ovules (*see* **Ovule** and **Pollen**). There are usually several Stamens in a flower, and the whole assemblage of them is often called the *andrœcium* (from the Greek words *aner, andros*, a male, and *oikos*, a house). A complete Stamen is made

FIG. 519. STAMEN, showing (*a*) Anther and (*f*) Filament.

up of two chief parts (see Fig. 519), the anther (*a*) and the filament (*f*) or stalk supporting the anther. In many plants, the filaments are long, and cause the anthers to project from the corolla or perianth (see Fig. 520). In other plants, they are shorter than the corolla; and in some there are no filaments (*e.g.*, in Orchids, in which the anther and the styles are adherent to one another). The filaments are usually free from one another, and are long and slender; but in many plants they are broad, or bear outgrowths (*Deutzia*), or are united into groups

FIG. 520. FLOWER OF LILIUM PYRENAICUM, showing long Stamens bearing Anthers projecting beyond the Perianth.

by their base (*Hypericum*), or grow together so as to form a more or less complete tube (*Eucharis, Hibiscus*). The anther is usually oval or linear; and in by far the greater number of plants it is evidently made up of two lobes, separated lengthwise by a portion called the "connective," which is similar in structure to the filament, and, in many anthers, is evidently a prolongation of it. The connective is very narrow and inconspicuous in some plants; broad in others, so that the lobes are widely separated. In some it is prolonged beyond the lobes at the tip, as a plate, or backwards

Stamen—*continued.*

in spurs or outgrowths of various forms. The uses of these variations in form and position, the structure of the walls of the two pollen-spaces in each lobe, and the course of development of the pollen, are described under **Nectary, Pollen,** and **Pollination.** Stamens vary in number from one (*Hippuris*) to an indefinite number (*Ranunculus*); but most frequently there are three, four, or five, arranged in one circle, or six, eight, or ten, in an outer and an inner circle. On the number and arrangement of the Stamens, Linnæus founded the great divisions in the classification named after him, and for years so widely used, and which is still frequently employed, as a most convenient key for rapidly determining the names of plants.

STAMINEAL. Consisting of, or relating to, stamens.

STAMINIFEROUS. Bearing stamens.

STAMINODE. A rudimentary stamen.

STAMINODY. A name for the metamorphosis of other organs into stamens.

STANDARD. The fifth or posterior petal of a papilionaceous corolla.

STANDARDS. A term applied to trees or plants that have an upright stem supporting the head. They are grown in the open, as, for example, Apple, Pear, Plum-trees, &c., in an orchard. Chrysanthemums, Heliotrope, and Mignonette, are examples of plants readily grown as Standards in pots.

STANGERIA (named after William Stanger, Surveyor-General of Natal, who died in 1854). ORD. *Cycadaceæ.* A monotypic genus. The species is a stove Cycad, requiring similar treatment to that recommended for **Zamia.**

S. paradoxa (paradoxical). Hottentot's Head. *l.* few, long-petiolate, pinnate, highly glabrous; pinnæ opposite and alternate, linear-lanceolate, obtuse, acute, or acuminate, spinuloso-serrulate or slightly crenate, rarely pinnatifid-lobed, traversed by parallel, forked veins, like those of a *Lomaria;* the lower ones petiolulate and sometimes bifid at base, the upper ones sessile. *cones* pedunculate, villous, densely clothed with imbricating scales in many series; males cylindrical; females shorter, oblong-cylindrical. Trunk or caudex 1ft. long, nearly subterraneous, sub-cylindrical, turnip-like, or deformed, narrowed at base. *h.* 2ft. South-eastern sub-tropical Africa, 1851. (B. M. 5121.)

S. p. Katzeri (Katzer's). *l.* few, ovate; pinnæ about eleven pairs, obverse-oblong, roundish and mucronate at apex, slightly undulated and crenately repand along the margins. This differs from the type in its smaller size. (R. G. 798, under name of *S. Katzeri.*)

S. p. schizodon (cut-toothed). *l.*, pinnæ irregularly inciso-serrate. 1872. This is the more robust form; it represents the one extreme, whilst *S. p. Katzeri* represents the other.

STANHOPEA (named in honour of Earl Stanhope, 1781-1855, President of the Medico-botanical Society). SYN. *Ceratochilus.* ORD. *Orchideæ.* A genus including about thirty species of beautiful, stove, epiphytal orchids, natives of tropical America, from Brazil to Mexico. Flowers large, few, in a loose raceme, pedicellate; sepals and petals free, spreading, the latter sometimes undulated; lip thick and fleshy, variable and remarkable in structure; the hinder portion (hypochil) usually saccate, the middle part (mesochil) often two-horned, and the anterior portion (epichil) more or less movable; column erect or incurved; pollen masses two; bracts membranous, spathe-like; scape deflexed or pendulous. Leaf ample, plicate-veined, contracted into the petiole. Stem very short, many-sheathed, one-leaved, usually thickened below into a fleshy pseudo-bulb. Although the flowers of the Stanhopeas are ephemeral, lasting but a few days in perfection, yet their free-blossoming habit should secure their presence in all collections. Some of the flowers are very handsome, and many are very strongly perfumed.

Stanhopea—*continued.*

On account of the peculiar manner in which they are produced, the plants should be grown in baskets made even more open at the bottom and sides than is usual for other Orchids, as the racemes are pendulous, and often come out from beneath the basket. The latter should be suspended in a stove or house devoted to East Indian and Brazilian Orchids, and kept watered liberally during the period of growth. When at rest, the roots should be kept rather dry. The plants should be surrounded with fresh sphagnum, a few lumps of turfy peat, and some charcoal. The leaves should be sponged occasionally with clean water, as they are liable to be attacked by thrips and red spider. Propagation is effected by division of the old plants.

S. aurea (golden). A synonym of *S. Wardii aurea.*

S. Bucephalus (bull-horned).* *fl.* emitting a powerful fragrance; sepals, petals, and hypochil pale rich yellow, with purple dots and small blotches everywhere except on the hypochil; hypochil boat-shaped; mesochil two-horned; epichil roundish-ovate, cuspidate; raceme deflexed, consisting of several flowers. August. *l.* stalked, oblong, acuminate, plicate. *h.* 2ft. South Mexico to Peru, 1843. A remarkably handsome Orchid. (B. M. 5278; B. R. 1845, 24.)

S. B. guttata (spotted). *fl.*, sepals, petals, and hypochil of a deep apricot-colour; each petal, and the hypochil, marked with four brown blotches.

S. B. Roezlii (Roezl's). *fl.*, sepals, petals, and base of the lip deep saffron-yellow, spotted with brown; horns and column white, the latter also dotted with purple. Nicaragua, 1874. (R. G. 785.)

S. cirrhata (tendrilled). *fl.* absolutely solitary; sepals white, obtuse, much longer than the ovate, yellow petals; lateral horns of the yellow and violet lip produced from the hypochil, which is three-ribbed within, and rounded outside; mesochil wanting; epichil ovate, undivided; bracts spathe-like, imbricated, longer than the ovaries; column wingless, extended into a pair of feelers, as in some Odontoglots. *h.* 1ft. Nicaragua, 1840. (G. C. 1850, p. 295; L. & P. F. G. i. p. 31, 19.)

S. deltoidea (deltoid). *fl.* of a palish yellow, dotted over with crimson specks, large; lip orange-coloured, blackish-brown at the base, and marked on each side with a reddish-brown spot. Peru (?), 1862.

S. Devoniensis (Duke of Devonshire's). *fl.* pale creamy-yellow, thickly and irregularly spotted with deep crimson-purple, sweetly scented; dorsal sepal and petals barred near the base; lip whitish, purple-spotted; hypochil sub-globose, with a deep purple stain over the lower half; mesochil short, two-horned; epichil obtusely angled, rhomboid, obsoletely three-toothed at the end; peduncle bearing two flowers. July and August. *l.* shortly petiolate, lanceolate, plicate, pale green. Pseudo-bulbs ovate, ribbed. *h.* 1½ft. Guatemala, 1853. (F. d. S. 974; L. S. O. 1.)

S. eburnea (ivory-like). *fl.* white, fragrant; lip oblong, twice as long as the petals; hypochil and mesochil dull purple, or spotted with purple on the upper side, the latter solid, changing, truncate; epichil ovate; column very long; bracts shorter than the ovary; scape lax, pendulous. June. Venezuela, Guiana, and Brazil, 1828. (B. M. 3359; B. R. 1529.)

S. e. spectabilis (remarkable). *fl.* pale straw-coloured, powerfully scented; sepals broad; petals narrow; lip white, varnished, unmarked, except a pair of crimson lines, and a few small crimson dots at the base. Venezuela, 1868. (I. H. 531.)

S. ecornuta (hornless). *fl.* in pairs, about 4½in. across; hypochil somewhat slipper-shaped, extremely fleshy, bright orange, passing into pure white towards the point, handsomely purple-blotched on its sides, hornless, but having four little tumours; the rest of the flower pure white, except a few purple spots near the base of the firm, concave petals; bracts shorter than the ovary; scape short, pendulous. Central America, 1854. According to Dr. Lindley, this "may be regarded as a species with the hypochil (or lower half of the lip) alone present." (B. M. 4885; L. & P. F. G. i. 31; F. d. S. 181 and R. X. O. i. 43, under name of *Stanhopeastrum ecornutum.*)

S. florida (flowery). *fl.* white, large; sepals and petals marked on the inside with small, purple spots; lip covered with small, purple dots, and having a large blotch on each side between the two keels. Mexico (?), 1880. (G. C. xvi. pp. 561, 565; R. G. ii. 39.)

S. gibbosa (gibbous). *fl.* dull yellow, blotched and barred with dull crimson, the colouring becoming darker on the sepals, about 6in. in diameter; hypochil incurved, keeled on each side; mesochil furnished with ligulate-falcate horns; epichil oblong, acute. June and July. Central America, 1870. A fine species, somewhat resembling *S. Wardii.*

S. grandiflora (large-flowered).* *fl.* pure white, except a few crimson dots on the middle and basal parts of the lip, fully 6in. in diameter when expanded, very fragrant; hypochil roundish, two-horned in front; mesochil solid, truncate, hornless, but obsoletely three-toothed; epichil ovate; column very long; scape short, pendent. *l.* broadly lanceolate, plicate. Pseudo-bulbs ovate, furrowed. Trinidad, 1824. SYN. *Ceratochilus grandiflorus* (B. iv. 176).

S. graveolens (strong-smelling). *fl.* having an extremely powerful and disagreeable odour; sepals and petals delicate straw-colour; lip at the base, and the central parts of the flower generally, of a rich, deep apricot-yellow, while the horns and upper end of the lip are like ivory turning yellow; column very broad, winged to near the base, so as to have almost the form of a parallelogram; bracts narrow, scarcely equalling the ovary; spike expanded. Guatemala (?), 1843.

S. g. aurita (eared). A variety with flowers wholly of a deep apricot-colour.

S. guttulata (slightly spotted). A synonym of *S. oculata.*

S. inodora (scentless). *fl.* pale straw-colour, with the short, saccate hypochil alone yellow, scentless; mesochil two-horned, two-toothed, deeply sulcate between the teeth; epichil somewhat rounded-ovate, entire, longer than the incurved horns; wings of the column gradually narrowing downwards until they entirely disappear; bracts broadly oblong, equalling the ovary; spike contracted. May. Mexico, 1844. (B. R. 1845, 65; R. X. O. 165.)

S. i. amœna (pleasing). *fl.*, hypochil deep yellow, with brownish-red eyes; epichil rose-coloured, dotted; horns dotted inside, much acuminate.

S. insignis (remarkable).* *fl.* of a pale dull yellow, richly spotted and stained with purple, large, showy, fragrant; hypochil globose, split in front; mesochil bearing falcate, incurved horns; epichil roundish-ovate, entire, shorter than the horns; column remarkable for its broadly-winged margin, which gives it almost the shape of a battledore; spike drooping, three or four-flowered. August and September. *l.* broadly lanceolate, dark green, plaited. Pseudo-bulbs clustered, ovate, furrowed. Brazil, 1826. A very handsome species, the type of the genus. (B. M. 2948-9; B. R. 1837; L. B. C. 1985; R. X. O. 164.)

S. i. flava (yellow). *fl.* wholly yellowish, very sweet-scented.

S. macrochila (large-lipped). *fl.* white or cream-coloured, marked with crimson spots disposed in lines. Mexico, 1859. (I. H. vi. p. 71.)

S. Martiana (Martius'). *fl.*, sepals pale straw-coloured, with a few small, vinous spots; petals white, larger-spotted, and with a broad blotch of crimson at base; lip white; hypochil short, sessile, scrotiform; mesochil short, with nearly straight, cirrhose horns; epichil oblong-linear, obscurely three-toothed; column pubescent, the margins scarcely dilated; peduncles two-flowered. Autumn. *l.* lanceolate, plicately veined. Pseudo-bulbs ovate, furrowed. Mexico, 1843. A magnificent and distinct species. (F. d. S. 2112-3; B. R. 1843, 44, under name of *S. M. bicolor.*) SYN. *S. velata.*

FIG. 521. STANHOPEA OCULATA, showing Habit and detached Flower.

Stanhopea—*continued.*

S. oculata (eyed).* *fl.* usually lemon-coloured, with a large number of lilac spots on the sepals, a smaller number on the petals, a deep yellow eye, and two, or occasionally four, large, dark brown spots on the side of the hypochil, which is very much lengthened out, as if unguiculate; horns semi-terete, ascending, acute; peduncle bearing a drooping raceme of about six flowers. July to November. *l.* large, broadly lanceolate, nerved. Pseudo-bulbs small. Mexico, 1829. A free-flowering and very showy species. See Fig. 521. (B. M. 5300; B. R. 1800.) SYNS. *S. guttulata*, *Ceratochilus oculatus* (L. B. C. 1764). Numerous varieties of this species occur in gardens, varying in colour and in the spotting of the lip. Most of them are sweet-scented.

S. o. Barkeriana (Barker's). *See* **S. o. Lindleyi.**

S. o. crocea (saffron-yellow). A synonym of *S. ornatissima.*

S. o. Lindleyi (Lindley's). *fl.* of a dull wine-red, but little spotted. *S. o. Barkeriana* is probably the same as this.

S. ornatissima (very ornate). *fl.* of a deep orange-colour, spotted with red, and marked towards the base with large blotches of reddish-brown; spikes drooping, six to seven-flowered. *l.* plaited. Peru (?), 1862. (I. H. 325; R. G. 189, under name of *S. oculata crocea.*)

S. platyceras (broad-horned). *fl.* nankeen-yellow, marked with purplish dots and circles of small points, large; hypochil marked on each side with one large, brownish-purple spot. New Grenada, 1868. This plant is closely related to *S. grandiflora.* (Ref. B. 108.)

S. pulla (blackish). *fl.* apricot-yellow, small; lateral sepals oblong, acute, reflexed, the upper one narrower; petals very bright yellow, shorter, narrower, ligulate, acute, very bright yellow; lip very bright, shining, like a plump shoe with a roundish knob at its top and with sharp, semi-oblong side borders; inside stands a nearly square body with four keels, converging like the letter V; between this and the apical knob is an inconspicuous, transverse slit; knob white; the side borders and V-like keels brownish-purple; peduncle short, strong, two-flowered. Pseudo-bulbs short, conical, ribbed, dark. Costa Rica, 1877. (R. X. O. 205.)

S. quadricornis (four-horned). *fl.* pale yellow, sparingly spotted with crimson; hypochil oblong, having two prominent horns standing erect on the lower edge of the cavity; mesochil two-horned, fleshy, excavated; epichil ovate, entire, shorter than the terete, incurved horns; bracts very short, narrow. Central America. (B. R. 1838, 5.)

S. radiosa (rayed). A synonym of *S. saccata.*

S. Reichenbachiana (Reichenbach's). *fl.* of a delicate shining white; sepals and petals becoming ochre-coloured; hypochil becoming rosy, semi-globose, prolonged on the upper border into an angle; mesochil solid, with a deep channel, abrupt in front; epichil triangular, rather convex. Columbia, 1879. A curious plant, resembling *S. eburnea*, but larger and more conspicuous.

S. Ruckeri (Rucker's). "A noble species, with the habit of *S. Wardii*, and its general colour, except that it is paler; but the epichil is beautifully stained with pink, and the eyes of the hypochil are very faint. It is distinctly separated by the peculiar form of the hypochil, which, instead of being oblong, is so much narrowed to the base as to be obovate; by the entire want of lateral teeth on its margin; and by the presence of a very strong, inflexed tooth, in which the wide, not closed-up fissure of the mesochil terminates" (Lindley). Nicaragua, 1843. (L. J. F. 375, under name of *S. R. speciosa.*)

S. saccata (saccate). *fl.* greenish-yellow, regularly speckled, but not blotched, with brown, deep yellow at base, small; sepals and petals turned completely back on the ovary; hypochil very deep and incurved; mesochil reduced to space sufficient for the development of two broad, flat horns; epichil oval, three-lobed; bracts shortened. Guatemala, 1836. SYN. *S. radiosa* (I. H. viii. 270).

S. Shuttleworthii (Shuttleworth's). *fl.* having the sepals, petals, and basal part of the lip apricot-colour, with dark purple blotches; front part of the lip whitish-yellow, with dark purplish spots on the anterior blade; column whitish, with a green middle part, spotted with purple on the inside. Columbia, 1876. This is allied to *S. insignis.*

S. tigrina (tiger-marked).* Lynx Flower. *fl.* deep orange-yellow, richly blotched with purplish-brown, powerfully scented, as much as 8in. in diameter; hypochil roundish, yellow, having radiating, toothed lamellæ within the cavity; mesochil two-horned; epichil oval, equally trifid, equalling the flat, falcate horns; column excessively broad; raceme three or four-flowered. July to September. *l.* large, broadly lanceolate, deep green, plicate. Mexico, 1836. This is, without doubt, the finest species of the genus. (B. M. 4197; B. R. 1839, 1; F. d. S. 713-5, under name of *S. t. superba.*)

S. t. lutescens (yellowish). *fl.* brilliant yellow, inclining to orange, barred with deep chocolate, very large and handsome. Guatemala. A grand variety for exhibition.

S. t. nigro-violacea (blackish-violet). *fl.* wholly of a deep brown-purple, except the edges of the sepals and petals and the upper half of the lip.

Stanhopea—*continued.*

S. tricornis (three-horned). *fl.* whitish-ochre, with darker tips, having crimson spots on the disk and base of the petals and on the base of the sepals; dorsal sepal reflexed over the ovary, the lateral ones spreading; petals entirely covering the lip; hypochil marked on the outside with white, longitudinal lines, rough within and purple dotted, half-globular; epichil orange-ochre, having a third horn at the base in addition to the two present at the side; horns ligulate, acute; peduncle pendent, two-flowered. Pseudo-bulbs small. Peru, 1879. (L. & P. F. G. i. p. 31; F. M. n. s. 469.)

S. velata (veiled). A synonym of *S. Martiana.*

S. venusta (charming). A form of *S. Wardii.*

S. Wardii (Ward's).* *fl.* showy, and deliciously scented; sepals and petals golden-yellow, much dotted with purple; lip pale yellow, with two large, dark velvety-purple spots on the deep yellow, oblong, depressed hypochil; mesochil having two fleshy horns dotted with purple; epichil roundish-ovate, acute, with two semi-terete, falcate, sub-cirrhose horns, also thickly spotted with purple; racemes drooping, several-flowered. *l.* broad, acuminate, plicate. Guatemala and Venezuela, 1836. (B. M. 5289; L. S. O. 20.) *S. venusta* is a whole-coloured variety of this species. *S. graveolens* (F. d. S., Aug., 1846) is a form of *S. Wardii*, having flowers of a dirty-white colour, merging into golden-yellow at the centre.

S. W. aurea (golden). *fl.* of a deep orange-yellow, large and fragrant; hypochil bearing two dark spots "which are in some manner lost in the flood of yellow that surrounds them" (Lindley). Summer and autumn. 1835. SYN. *S. aurea.*

S. Warscewicziana (Warscewicz's). *fl.*, sepals and petals dirty-white, the latter very acuminate; hypochil yellowish-white, globose, highly glabrous within; mesochil two-horned, deeply sulcate, with reflexed teeth; epichil finely dotted with red; horns very acute, incurved; column broadly winged, unguiculate; bracts much shorter than the ovary. Chiriqui Mountains. (R. X. O. ii. 125.)

S. xytriophora (pitcher-bearing). *fl.* of a pale straw-yellow, with purple markings on the base of the lip and purplish dots on the rhomboid epichil; hypochil remarkably short. Peru. 1868.

STANHOPEASTRUM ECORNUTUM. *See* **Stanhopea ecornuta.**

STANLEYA (named in compliment to Edward Stanley, Earl of Derby, who took an interest in many sciences, especially ornithology). ORD. *Cruciferæ.* A genus comprising three species of stout, hardy, glaucous, perennial herbs, confined to California. Flowers yellow, many in elongated, straight racemes; sepals short, spreading; petals narrow, elongated, long-clawed. Leaves undivided or pinnatifid. *S. pinnatifida*—the only species introduced to cultivation—is a pretty plant, thriving in vegetable mould, in the open border. It may be increased by seeds, or by divisions.

S. pinnatifida (pinnatifid-leaved). *fl.* yellow, very closely resembling those of a species of *Cleome.* May. *l.* interruptedly pinnatifid, thick, similar to those of a species of *Brassica.* *h.* 3ft. 1812.

STANNIA. A synonym of **Posoqueria** (which *see*).

STAPELIA (named by Linnæus after Boderus à Stapel, a physician of Amsterdam, and commentator on Theophrastus; he died in 1631). Carrion Flower. Including *Caruncularia*, *Gonostemon*, *Orbea*, *Tridentea*, and *Tromotriche.* ORD. *Asclepiadeæ.* A large genus (upwards of sixty species have been described) of low, thickly fleshy, leafless, greenhouse succulents, confined to South Africa. Flowers usually large and showy, but having a fœtid odour (like carrion), solitary, twin, or rarely fascicled, at the base or sides of the branches, on short, or rarely long, peduncles; calyx five-parted, with five glands within the base; corolla livid-purple or pale yellow, spotted and marbled, with a very short tube, and a much-spreading, five-lobed limb, the lobes broad or narrow, valvate; corona double, the outer horizontally spreading and deeply five-lobed, the inner consisting of five scales; stamens affixed at the base of the corolla. Stems deeply four-angled and toothed; young specimens sometimes having a caducous, rudimentary leaf at the apex of the teeth. A selection of the species most worthy of cultivation is given below. All require a thoroughly well-drained compost. This can be obtained by using a

Stapelia—*continued.*

good supply of pieces of brick rubbish amongst the sandy loam in which they are potted. During winter, they should have but little water. A shelf near the glass, in a light, sunny, airy place, is best adapted for them. Propagated by cuttings. Several plants formerly included under *Stapelia*, will now be found under **Duvalia, Huernia, Piaranthus,** and **Podanthes** (which *see*).

S. anguinea (snake-speckled). *fl.* glabrous; corolla yellow, marked with numerous rufous spots; orb large, marked with large spots of two forms, dark brown-yellow on the sides near the base; gynostegium dotted with dark brown; peduncles solitary in the axils of the branchlets. June and July. Branches erect, with sub-recurved teeth. *h.* 6in. 1812. (L. B. C. 828; B. M. 1169, under name of *S. picta.*)

S. Asterias (star-fish).* Starfish Flower. *fl.* large; corolla of an obscure violet-colour, the segments variegated with transverse, yellowish stripes, the bottom dark purple; segments lanceolate, oblique, with revolute margins, ciliated, wrinkled; peduncles often solitary. May to November. Branches many, erect, toothed; teeth short and erect, or slightly incurved with an acumen. *h.* 6in. 1795. One of the handsomest species. (B. M. 536; L. B. C. 453.)

S. barbata (bearded). A synonym of *Huernia barbata.*

S. Bayfieldii (Bayfield's). *fl.*, corolla 2½in. to 2¾in. in diameter, with the lobes expanded; back puberulous, green, tinged with purple, the nerves darker; face glabrous, purple-red, darker towards the tips, the centre to half-way up the lobes marked with numerous pale yellow, transverse lines; ligulæ dull brownish-red or dark purple-brown; peduncles two lines long, three to five-flowered; pedicels eight to ten lines long. Stems erect, branching at base, 6in. to 8in. high, seven to nine lines thick, puberulous, with concave sides, and stout, short, nearly horizontal, teeth. Before 1877. (G. C. n. s., vii. p. 430.)

S. bufonis (toad-like). A synonym of *S. normalis.*

S. campanulata (bell-shaped). A synonym of *Huernia campanulata.*

S. Corderoyi (Corderoy's). A synonym of *Duvalia Corderoyi.*

S. Courcelli (Courcell's). A garden synonym of *S. patentirostris.*

S. Curtisii (Curtis's). *fl.*, corolla much spreading, deeply five-cleft; segments sulphur-colour, with transverse, oblong spots of dark blood-colour, ovate, acuminate, glabrous; tube yellowish; peduncles one-flowered, reflexed. June to September. Branches tetragonal, with acute, or slightly reflexed, teeth. *h.* 1ft. 1690. (B. M. 26 and R. H. 1857, p. 43, under name of *S. variegata.*)

S. deflexa (deflexed). *fl.*, corolla deeply five-cleft, about 2in. in diameter; segments lanceolate, acute, dingy greenish or pale reddish, ciliated, revolute on the margins, wrinkled; pedicels on a short and thick peduncle, much spreading, one-flowered. Summer. Branches ascending, erect, glabrous, tetragonal, with erect teeth on the angles. 1815. *h.* 4in. to 6in. (B. M. 1890; L. B. C. 135.)

S. divaricata (divaricate-branched). *fl.*, corolla greenish-brown outside, flesh-coloured within, tipped with green, glabrous, shining; segments lanceolate, spreading, with revolute, ciliated edges; corona orange, the outer segments mucronate; pedicels twin or tern. June to November. Branches numerous, tetragonal, glabrous, gradually attenuated, with small, erect teeth. *h.* 6in. 1793. (B. M. 1007; L. B. C. 941.)

S. eruciformis (caterpillar-like). A garden synonym of *S. olivacea.*

S. gemmiflora (bud-flowered). *fl.*, corolla large; segments dark fuscous, spotted with yellow at the throat, transversely and loosely wrinkled, ovate, acute; peduncles two or three. October and November. Branches many, erect, tetragonal, with sub-erect, acute teeth. *h.* 6in. 1795. (B. M. 1839.)

S. gigantea (gigantic). *fl.* pale yellowish, covered with irregular, brownish-red lines, and suffused with reddish around the corona, of an enormous size, 12in. to 14in. in diameter, the surface wrinkled, and sparsely covered with short, pale hairs; lobes lanceolate, acuminate, the margins fringed with similar hairs; corona dark purplish-brown. Stems resembling those of *S. Plantii.* *h.* 6in. 1862. The finest plant of the whole genus. (G. C. n. s., vii. p. 693.)

S. glabriflora (glabrous-flowered). *fl.*, corolla deeply five-lobed; lobes lanceolate, acuminate, at first spreading, and then 3in. to 4in. in diameter, afterwards strongly reflexed, the face entirely glabrous without a fringe, dull red-purple, with numerous transverse, yellowish-white lines; corona dark purple-brown, the ligulæ linear, concave, recurved at apex, obtuse, with a minute tooth; wings free to the base, divergent, oblong, obtuse; pedicels ½in. long, pubescent. Stems pubescent, erect, quadrangular. *h.* 4in. to 8in. 1862. This is known in gardens as *S. grandiflora minor.* (G. C. n. s., vi. p. 809.)

S. grandiflora (large-flowered). *fl.* large, rather flat; corolla dark purple at the bottom, but the ovate-lanceolate segments are of a lighter purple, ciliated with grey hairs, and striped with white; peduncles three-flowered. September to December.

Stapelia—*continued.*

Branches quadrangular, clavate, downy, with remote tubercles or teeth. *h.* 1ft. 1795. Plant grey from down. See Fig. 522 (R. H. 1858, p. 152.)

FIG. 522. STAPELIA GRANDIFLORA.

S. g. lineata (lined). This only differs from the type in the corolla lobes being marked across the basal half with yellow lines. 1873. (G. C. n. s., vii. p. 559.)

S. g. minor (lesser). A garden synonym of *S. glabriflora.*

S. Gussoniana (Gussone's). A synonym of *Boucerosia europæa.*

S. hamata (hooked). *fl.*, corolla blood-coloured, 3in. across, flat, ciliated, wrinkled above, with a hairy centre; segments transversely striped with white, acuminated, ciliated with red hairs; outer coronal segments emarginate, the inner leaflets linear-subulate, hooked. July and August. Branches erect, tetragonal, shining green; young ones sulcate; adults flatter, with short, erect or incurved, pale teeth. *h.* 3in. 1820. (L. B. C. 242.)

S. hirsuta (hairy). *fl.*, corolla yellowish, with transverse, deep violet stripes, a pale red, villous bottom, and red nectaries, wrinkled; segments villously ciliated with white hairs; outer coronal segments acute, lanceolate, the inner leaflets spreading. July and August. Branches erect, slightly villous, dingy green, sulcate-tetragonal, floriferous at the base, the angles having erect teeth. *h.* 6in. 1710. (H. E. F. 230.) The variety *atra* has deep purple flowers. (B. R. 756.)

S. lævis (smooth). *fl.* showy; corolla segments lanceolate, acute, green beneath, purple above, yellowish at apex, dotted with dark red; peduncles long, one-flowered; inner coronal leaflets caruncular. June to November. Branches stout, and, as well as the branchlets, oblong, smooth, obscurely sulcate, not toothed. *h.* 3in. 1790. (B. M. 793, under name of *S. pedunculata.*) SYN. *Caruncularia pedunculata.*

S. maculosa (spotted). *fl.* very fœtid; corolla smooth, ciliated; segments dirty yellow, red at the tips and edges, almost covered by large, confluent, rufous spots, ovate, acute; orb waved, elevated, downy; peduncles three or four, aggregated at the bases of the younger branches. June to September. Branches very numerous, erect, glabrous, green; adults loosely pubescent, tetragonal, with spreading teeth. *h.* 1ft. 1804. (B. M. 1833.)

S. Massoni (Masson's). *fl.* 4in. to 4½in. in diameter; corolla brownish-purple, marked with a few, narrow, yellowish lines on the glabrous lobes, and the disk thickly covered with fine, short,

Stapelia—*continued.*

purple hairs. July. Branches quadrangular, pubescent. An old garden plant.

S. mutabilis (changeable). *fl.*, corolla greenish-yellow, with numerous transverse, purple stripes, ciliated with red, clavate, tremulous hairs; inner branch of the inner corona clavate; ligulæ three-toothed; peduncles usually in twos or threes. June and July. Branches erect, tetragonal, narrow, with erect, obtuse teeth. *h.* 6in. 1823.

S. namaquensis (Namaqualand).* *fl.* large; corolla bright yellow, with crowded and more or less confluent, dark purplish-brown spots; lobes much wrinkled, not fringed; outer coronal lobes entire, acute. Branches thick, glabrous, beautifully mottled. *h.* 3in. to 4in. 1883. One of the handsomest species.

S. n. tridentata (three-toothed). *fl.* having the corolla lobes fringed with short hairs, and the outer coronal lobes truncately three-toothed at apex. 1883.

S. normalis (normal). *fl.*, corolla much spreading, 2in. or more in diameter; segments yellow, with transverse stripes and spots of dark blood-colour, ovate, acute, outwardly of a pale sulphur-colour, lined; peduncles solitary, one-flowered, much spreading. July and August. Branches many, declinate or ascending, glabrous, tetragonal, with much-spreading teeth. *h.* 6in. 1821. (B. R. 755; B. M. 1676, under name of *S. bufonis.*)

S. olivacea (olive-coloured). *fl.* very fœtid, two to six from the bases of the younger branches; corolla dull green and puberulous outside, glabrous within, with numerous crowded, brown, transverse rugæ on a dark olive-green or sometimes pale olive ground, about 1¼in. in diameter; coronal scales dark purple-brown; peduncles two to three lines long. September. Stems erect, rather slender, branching at base, minutely puberulous, 3in. to 5in. high, ⅜in. to ½in. thick, with rounded edges, becoming blotched with purple on full exposure to the sun. 1874. (B. M. 6212; G. C. n. s., iii. p. 137.) SYN. *S. eruciformis* (of gardens).

S. orbicularis (orbicular). *fl.*, corolla pale yellow, having approximate, brownish lines on the segments, much spreading; segments cordate, recurved at apex, acuminate, striate-wrinkled; orb yellow, dotted with brown, tumid; peduncles near the base of the branchlets, solitary, one-flowered. July to November. Branches many, erecto-patent, tetragonal, with mucronulate teeth. *h.* 6in. 1799. (A. B. R. 439; F. d. S. 1281; L. B. C. 811.)

S. patentirostris (spreading-beaked). *fl.* one to three together, on pedicels 1½in. long; corolla 2½in. to 3½in. in diameter, the face wrinkled, rich dark purple-brown, with numerous transverse, yellowish lines on the basal part of the lanceolate, acuminate lobes, the centre densely villous with rich purplish-red hairs, the lobes fringed with long, pale purple hairs; ligulæ linear-lanceolate, obtuse, with a central tooth; wings linear-oblong, horizontal; rostra subulate, horizontally recurved over the wings, reaching nearly to the sinuses of the corolla. Autumn. Stems rather slender, puberulous, toothed. *h.* 6in. 1870. Also cultivated under the name of *S. Courcelli.* (G. C. n. s., vii. p. 140; B. M. 5963, under name of *S. sororia.*)

S. pedunculata (long-peduncled). A synonym of *S. lævis.*

S. picta (painted). *fl.*, corolla sulphur-coloured, marbled and spotted with dark blood-colour; segments ovate, acuminate, wrinkled; orb elevated, much wrinkled, depressed in the middle; peduncles from the base of the branchlets, solitary, one-flowered. June to September. Branches simple, erect, tetragonal or quadrisulcate, slightly torulose. *h.* 6in. 1799.

S. planiflora (flat-flowered). *fl.*, corolla much spreading, half-quinquefid; segments pale sulphur-coloured, lined and spotted with dark purple, ovate, acuminate, transversely wrinkled; peduncles from the axils of the younger branchlets, solitary or twin, one-flowered. July to November. Branches many, branched, ascending or nearly erect, glabrous, sulcate-tetragonal, with much-spreading teeth. 1805. (L. B. C. 191.)

S. Plantii (Plant's). *fl.* on stout, pubescent peduncles; corolla 5in. in diameter, villous round the throat; lobes purplish-brown in the centre, and there transversely barred with wavy, yellow bands, broadly black-purple at apex and on the margins, 1in. to 1½in. broad, ovate-lanceolate, ciliated with long hairs. November. Stem stout, creeping; branches downy, 5in. to 9in. long, erect, columnar or sub-clavate, with four thick, remotely-toothed wings. 1866. (B. M. 5692; F. d. S. 2012.)

S. pulvinata (cushion-flowered). *fl.*, corolla deep violet, large, flat, elevated and very villous at the bottom; segments variegated with whitish, transverse wrinkles, fuscous and concave at the apex, rufous beneath, roundish, abruptly acuminate, ciliated; peduncles mostly solitary, terete, from the axils of the branchlets. June to November. Branches and branchlets many, reclinate, with erect, green teeth. 1795. A very elegant species. (B. M. 1240; L. B. C. 206.)

S. revoluta (revolute-flowered). *fl.* sub-solitary, on very short peduncles; calyx segments acute; corolla red, with whitish blotches, smooth, very fleshy, the segments revolute, with fringed margins. July. Branches tetragonal, erect, denticulated, the sides hollowed out. 1801. (B. M. 724.)

S. rufa (rufous). *fl.*, corolla glabrous; segments of an obscure violet, variegated with deep purple or pale red, transverse stripes, having the bottom stellate, rufous, and variegated, the margins ciliated with dark violet hairs; peduncles two or three together, short, purplish. June to November. Branches erect, tetragonal, with small, erect, obtuse teeth. *h.* 3in. to 6in. 1795. (L. B. C. 239.)

S. Simsii (Sims'). *fl.*, corolla ample, flat, glabrous; segments dark violet, with slender, whitish lines about the throat, without greenish or obscurely tinged with violet, ovate, acuminate, five-nerved; peduncles erect, at the tips of the branchlets. May to November. Branches glabrous, the angles obsoletely nippled, toothed; teeth having a green, deciduous acumen. *h.* 3in. to 6in. 1800. (B. M. 1234, under name of *S. vetula.*)

S. sororia (sisterly).* *fl.* 3in. to 4½in. in diameter; corolla clothed with long hairs; lobes dark vinous-purple, ovate, acuminate, transversely wrinkled, the folds towards the base bright orange-yellow; processes of the column deep purple; peduncles solitary or twin, 3in. to 4in. long. July. Stems 6in. to 10in. high, with erect or horizontal branches ½in. to ⅔in. in diameter, the angles toothed at intervals of ½in. to ⅔in., the teeth soft and incurved. 1797. Plant pale green, glabrous, variable in size. (L. B. C. 94.)

S. spectabilis (showy). *fl.*, corolla large, flat; segments ovate-lanceolate, furnished from the base behind the middle with dense, red hairs, and having pale stripes on the upper surface, with black tips. November to January. Branches quadrangular, clavate, toothed on the angles, the teeth remote, incurved, whitish. *h.* 1ft. 1802. (B. M. 585, under name of *S. grandiflora.*)

S. stricta (straight). *fl.*, segments of corolla purple, with pale greenish margins, ovate, acuminate, nearly flat, glabrous, not ciliated; peduncles growing from the base of the branches. June to November. Branches tetragonal, smooth, simple, straight. *h.* 3in. 1814. (B. M. 2037.)

S. tsomoensis (Tsomo River). *fl.*, calyx lobes ¼in. long; corolla 3in. in diameter, the face entirely dull smoky-purple, darker at the tips of the lobes, or with some of the ridges greenish or dirty-yellowish, the disk and base of the lobes covered with purple hairs; lobes ovate-lanceolate; outer coronal segments purplish-black; pedicels ¾in. to 1in. long; cymes sub-sessile, four to nine-flowered. Summer. Stems 4in. to 6in. high, five to eight lines thick, the angles compressed, repand-toothed, very minutely puberulous. 1882.

S. unguipetala (claw-petaled). *fl.* 4in. to 4½in. in diameter; corolla rich purple-brown, marked two-thirds the way up the lobes with transverse, yellowish lines, the centre of the disk and five bands radiating to the sinuses, pale greenish-ochre; lobes lanceolate-attenuate, incurved-hooked at apex, fringed with long, pale purplish hairs, and the disk covered with long, silky, purplish-red hairs, the rest glabrous; ligulæ lanceolate, acute, and, as well as the free, deltoid-oblong wings and the recurving rostra, dark purple-brown. *h.* 6in. 1877. Allied to *S. patentirostris.* (G. C. n. s., vii. p. 335.)

S. variegata (variegated). A synonym of *S. Curtisii.*

S. vetula (oldish). A synonym of *S. Simsii.*

STAPHIDIASTRUM. A synonym of **Sagræa** (which *see*).

STAPHIDIUM (in part). Synonymous with *Clidemia.*

STAPHYLEA (from *staphyle*, a cluster; alluding to the disposition of the flowers and fruits). Bladder-nut Tree. SYN. *Bumalda.* ORD. *Sapindaceæ.* A small genus (five species) of hardy, branched shrubs, natives of Europe, the Himalayas, Japan, and North America. Flowers white, erect or pendulous, in axillary racemes or panicles; sepals five, equal, deciduous; petals five, erect, about as long as the calyx, imbricated; stamens five; pedicels bracteate, articulated. Capsule membranous, bladder-like. Leaves opposite, stipulate, three to five-foliolate or pinnate; leaflets involute in vernation, stipellate. The under-mentioned species thrive in ordinary soil. *S. colchica* is an excellent subject for forcing, when specially prepared for the purpose. Propagation may be effected, in autumn, by suckers, by layers, or by cuttings.

S. Bolanderi (Bolander's). *fl.*, sepals three lines long; petals a little longer; style and stamens much exserted. *l.*, leaflets three, glabrous, broadly oval or orbicular, abruptly acute, serrulate. California, 1883.

S. Bumalda (Bumalda). *fl.*, styles villous. June to August. *fr.*, capsule with two beaks. *l.* trifoliolate; leaflets oblong, acuminate, rather scabrous; serratures awned, protruding from the recesses of the crenæ. *h.* 6ft. Japan, 1812. (S. Z. F. J. 95.)

S. colchica (Colchican).* *fl.* seven to eight lines long; sepals and petals linear-spathulate, the former spreading; raceme terminal, erect or slightly nodding, compound, ovate, corymbose. Summer. *l.* ternate and pinnately five-foliolate, 4in. to 5in. long; leaflets approximate, ovate-oblong, acuminated, serrulated, puberulous towards the base beneath. *h.* 3ft. to 5ft. Caucasus. See Fig. 523. (G. C. n. s., xi. 117; R. G. 837; R. H. 1870, 257.)

S. pinnata (pinnate).* Job's Tears; St. Anthony's Nut. *fl.* in racemes. May and June. *fr.*, nuts globose, white, pistachio-

Staphylea—*continued.*

flavoured, in a bladdery capsule. *l.* pinnate, of five to seven oblong, glabrous, serrated leaflets. *h.* 6ft. to 12ft. South Europe. (Sy. En. B. 322.)

S. trifolia (three-leaved). *fl.*, petals obovate-spathulate, ciliated at base. May and June. *fr.*, nuts globose. *l.* trifoliolate; leaflets ovate, acuminate, regularly serrated, pubescent when young. *h.* 6ft. to 12ft. North America, 1640.

FIG. 523. FLOWERING BRANCH OF STAPHYLEA COLCHICA.

STAPHYLEÆ. A tribe of *Sapindaceæ.*

STAPHYLINIDÆ. A family of the large group of *Brachelytra*, the "Rove" or "Cocktail" Beetles. The species of this group agree in having the wing-cases,

FIG. 524. DEVIL'S COACH HORSE (GOERIUS or OCYPUS OLENS).

or elytra, very short (see Fig. 524), as indicated by the scientific name, which is derived from *brachys*, short, and *elytra*, the wing-cases. Their wings are, nevertheless, large, and have, accordingly, to be folded up, and packed away below the elytra. The hinder end of the bare abdomen is employed to help in this, being turned up to push the wings under their covers; hence, they are often called Cocktail Beetles. The name Rove

Staphylinidæ—*continued.*

Beetles refers to their active roving habits. There are many genera in the family *Staphylinidæ*, but they mostly differ too little to be distinguished by anyone save a practised entomologist. Few of them are over ½in. in length, though one or two exceed 1in.; many are microscopic in size. They are very often black, but frequently this is varied with yellow, reddish-brown, or rusty-red. These beetles vary greatly in habits. They are very abundant, and are, accordingly, to be met with everywhere. Towards the end of summer, they may be found crawling on the ground or on walls and palings, or on the wing; and the small species are but too familiar from their liability to fly into one's eyes or mouth. Over 200 species are known to occur in Britain. They may often be found in the utmost profusion in the dead bodies of animals, or in decaying remains of plants, both as larvæ and in the perfect state. Some of them are among the most efficient allies of gardeners, because of their influence in destroying noxious insects. None of them are injurious to healthy garden produce. The two species figured, viz., *Goerius olens*, or the "Devil's Coach Horse," and *Staphylinus*

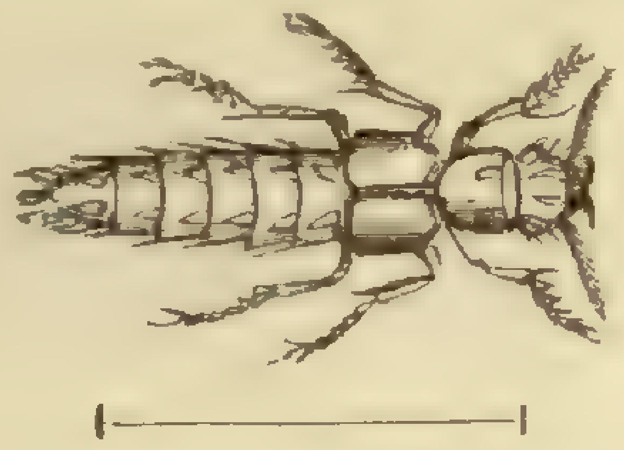

FIG. 525. STAPHYLINUS ERYTHROPTERUS (slightly magnified).

The Line shows the actual length of the Insect.

erythropterus (see Figs. 524 and 525) give a fair idea of the appearance of the family. The former preys on insects.

STAR APPLE. *See* **Chrysophyllum.**

STARCH. The greater part of the food material stored up by green plants for future use in their nourishment, and in the formation of new tissues, is formed of Starch. In those parts of plants in which food is stored, *e.g.*, in the tubers of Potatoes, in the pith of many plants, and in the albumen (or perisperm) in seeds of Cereals, Peas, and many other plants, Starch is very abundant, packed away in the cells in the form of small grains. These grains are frequently rounded, but may assume peculiar forms characteristic of certain plants. When very numerous, they become polygonal by mutual pressure. Under the microscope, each granule is seen to have a dark point, called the *hilum*, at one place; and around this are light and dark layers alternately. This appearance of layers, it is believed, is due to their containing a varying amount of water, as it is not apparent when the grains are either saturated or thoroughly dried. Often two or more granules are more or less completely united, forming "compound" granules. Though always small, they vary greatly in size in different plants. They are most readily recognised by running a solution of Iodine and Potassic Iodide under the cover-glass, when the granules become some shade of indigo-blue, varying with the strength of the solution. Starch consists of Carbon, Hydrogen, and Oxygen, in the proportions indicated by its chemical formula, $C_6H_{10}O_5$. This composition is the same as that of cellulose, the substance of which cell-walls are composed; and it is very nearly the same as that of several of the sugars, into which Starch is converted by a kind of slight fermentation. Starch is produced in the presence of light in the chlorophyl-bodies, and, therefore, only in the green parts of plants.

Starch—*continued.*

There is much doubt as to the exact part played by chlorophyl; most botanists believe that it forms the Starch granules, but others follow Pringsheim in thinking that the chlorophyl is only a shield against exposure to too intense light of the protoplasm, which they regard as the actual agent in the production of Starch. Whichever view is correct, the Starch is largely built up from the Carbon and Oxygen of Carbonic Acid gas in the atmosphere. The granules are not soluble in water, so, when there is need to convey Starch from one part of the plant to another, it is changed into a sugar, which is soluble, and, in this form, passes along to where it is to be used in building up new cell-walls, or where it must be stored up for a time. In the latter case, the Starch granules are again formed by the action of small pieces of protoplasm, named Starch-generators, which are fixed to the part of each granule farthest from the *hilum.*

STARFISH FLOWER. *See* **Stapelia Asterias.**

STAR FLOWER. A common name for several species of *Aster, Sternbergia, Triteleia,* and *Trientalis.*

STAR HYACINTH. *See* **Scilla amœna.**

STARKEA. A synonym of **Liabum** (which *see*).

STAR OF BETHLEHEM. *See* **Ornithogalum umbellatum.** The name is also applied to other species.

STAR OF NIGHT. A common name for *Clusia rosea.*

STARRY. Arranged in rays like the points of a star.

STAR, SEA. A popular name for *Aster tripolium.*

STARWORT. A common name for **Aster** and **Stellaria** (which *see*).

STATICE (the Greek name, used by Pliny for some astringent herb; from *statikos,* astringent). Sea Lavender. SYN. *Taxanthema.* ORD. *Plumbagineæ.* A large genus (upwards of 120 species have been described) of greenhouse, half-hardy, or hardy herbs, sub-shrubs, or shrubs, chiefly inhabiting saline districts and shores of temperate seas, most commonly found in Western Asia. Flowers one or two in the bracts, or often in few-flowered, many-bracted spikelets; calyx usually funnel-shaped, with a scarious, spreading limb; petals connate with the stamens in a ring towards the base, or free to the base; bracts subtending the spikelets, small, scale-like; peduncles or scapes leafless, often branched, cymose, corymbose, or paniculate. Leaves in the stemless species radical and rosulate, in the tufted sub-shrubs clustered, in the small shrubs somewhat scattered at the sides of the branches, alternate, flat, sometimes entire, linear, spathulate, oblong, or obovate, sometimes sinuately pinnatifid or dissected. *S. auriculæfolia, S. bellidifolia,* and *S. Limonium,* are included in the British Flora. The hardy species thrive in sandy soil, in the open border, or on rockwork. Their flowers are excellent for cutting, and for intermixing with other flowers in glasses, &c.; they are also well adapted for drying like everlastings. Annual and biennial species may be propagated from seeds, sown in early spring, in a frame, the young plants being put out into their permanent places when large enough. The perennials may also be raised from seeds when any are procurable, or increased by means of careful division. Greenhouse Statices are very useful and ornamental plants, nearly always more or less in flower. They succeed in good, turfy loam, with a little charcoal or sand intermixed, and may be increased by cuttings, inserted in small single pots, during early spring, and placed under a bell glass.

A selection of the most popular species, from a horticultural standpoint, is given below. Except where otherwise stated, the plants are herbaceous perennials.

Statice—*continued.*

S. ægyptiaca (Egyptian). A synonym of *S. Thouini.*

S. arborescens (tree-like).* *fl.* blue; spikelets two-flowered, few, in short, secund, rather loose spikes; floral branches very short; scape tall, branched above, ample and sub-corymbosely panicled. July. *l.* ample, ovate-oblong, petiolate, obtuse, mucronate, attenuated at base. Stem branched above, at length leafy. *h.* 2ft. Teneriffe, 1829. Greenhouse shrub. (B. 47; B. M. 3776; B. R. xxv. 6 and P. M. B. iv. 217, under name of *S. arborea.*)

S. Bonduelli (Bonduelle's). *fl.* yellow, sessile, in terminal corymbs; peduncles repeatedly dichotomous, clavate; bracts scarious. June. *l.* radical, lyrate, attenuated to the petioles, dilated at apex, terminating in a subulate mucro, pilose above, villous beneath. Stems tufted, branched, hairy at base. *h.* 1ft. North Africa, 1859. Greenhouse. (B. M. 5158; F. d. S. 2129; R. G. 318; R. H. 1885, p. 276.)

S. Bourgæi (Bourgeau's). *fl.* purple and white; spikelets one or two-flowered, two or three in fascicles at the extremities of the branchlets; lower bracts slightly reddish; scape compressed, 6in. to 12in. high, corymbosely paniculate above. August. *l.* ample, petiolate, stellate-puberulous, oblong, attenuated at base, slightly sinuate or often lyrate, the terminal lobe ovate, obtuse, mucronate. Canary Islands, 1859. Greenhouse sub-shrub. (B. M. 5153; F. d. S. 2292.)

S. brassicæfolia (Brassica-leaved). *fl.* purple; spikelets two-flowered, two or three fasciculate at the tips of the branchlets; lower bracts rufous, puberulous; scape angled, paniculately corymbose above. August. *l.* few, slightly ciliated on the margins, petiolate, lyrate; terminal lobe large, roundish-ovate, often irregularly lobed, very obtuse, cuspidate, sub-cordate at base; lateral ones two to four, ear-like, small, alternate, often confluent at base. *h.* 1½ft. Canary Islands, 1859. Greenhouse sub-shrub. (B. M. 5162.)

S. callicoma (beautiful-haired).* *fl.* pink; spikelets two-flowered, in short, rather broad, distichous spikes; scape dwarf; panicle ovate-triangular, sub-secund, the branches triquetrous. July. *l.* oblong and oblong-lanceolate, attenuated into the petioles, mucronate, white-tubercled, puberulous or glabrous. *h.* 1ft. Russia, 1804. Half-hardy. (R. G. 1063; B. M. 1629, under name of *S. conspicua.*)

FIG. 526. STATICE ELATA.

S. elata (tall).* *fl.* blue; spikelets two-flowered, in ovate, distichous, rather loose, imbricated spikes; bracts ovate, white-margined; scape 2ft. high, elongated-paniculate above, the branches hairy, triquetrous. July. *l.* obovate, very obtuse, often retuse and shortly mucronate at apex, rather long-attenuated into the petioles. Southern Russia, 1820. Hardy. See Fig. 526.

S. eximia (choice). *fl.* lilac, rose; spikelets about four-flowered, disposed in very dense, scorpioid-capitate, much-imbricated spikes; bracts pubescent; scape tall, paniculate or branched above, terete, pubescent. August. *l.* oblong or obovate, obtuse, shortly petiolate, narrowed, slightly crisped on the margins, long-attenuated into the petioles. *h.* 1ft. Songoria, 1844. Hardy. (B. R. 1847, 2.)

S. floribunda (bundle-flowered).* *fl.* violet-blue, produced in dense heads. 1882. A handsome plant, much resembling *S. profusa.*

S. Fortunei (Fortune's). A synonym of *S. sinensis.*

S. fruticans (shrubby). *fl.* blue; spikelets one or two-flowered, very few, in secund, very short, imbricated spikes; lower bracts ciliate-margined; scape 4in. to 6in. high, corymbose-paniculate or branched above, puberulous, closely compressed. Summer. *l.* near the base of the scape, ovate, 1½in. to 2in. long, ob-

Statice—*continued.*

tuse, mucronate, shortly attenuated into the petioles. Stem short, naked, terete. Canary Islands, 1847. Half-hardy shrub. (R. G. 319; F. d. S. 325, under name of *S. frutescens.*)

FIG. 527. STATICE SINUATA, showing Habit and detached Inflorescence.

S. Halfordi (Halford's). A garden variety of, or hybrid from, *S. macrophylla.*

S. imbricata (imbricated). *fl.* blue; spikelets three or four-flowered, few, in short, fascicled spikes; bracts velvety; scape tall, amply corymbose above, with undulated and broadly-winged branches. Summer. *l.* lanceolate, lyrate-runcinate, with eight or nine lobes on each side, setose-mucronate, 9in. to 10in. long. *h.* 1½ft. Teneriffe, 1829. A half-hardy, slightly tomentose sub-shrub. (F. d. S. 320, 321.)

S. incana (hoary), of Bieberstein. A synonym of *S. tatarica angustifolia.*

S. Kaufmanniana (Kaufmann's). *fl.* pink; scape 6in. to 16in. long, bearing several ascending spikes. Summer. *l.* all radical, lanceolate, acuminate, crisped, with thick margins. *h.* 1ft. Turkestan, 1880. A pretty, hardy perennial. (R. G. 996.)

S. latifolia (broad-leaved).* *fl.* blue; spikelets one (rarely two) flowered, rather remote, forming loose, very slender, slightly recurved spikes; bracts glabrous; scape tall, much-branched; panicle ample, effuse. June. *l.* large, oblong-elliptic, obtuse, long-attenuated into the petioles. *h.* 1ft. South Russia, 1791. Hardy.

S. leptoloba (slender-lobed). *fl.*, calyx purple, stellate, funnel-shaped; corolla yellowish, small; spikes about ½in. long, few-flowered; scape slender, repeatedly forked. Summer. *l.* all radical, oblanceolate-spathulate. Turkestan, 1881. Habit tufted. Hardy. (R. G. 1045.)

S. macrophylla (large-leaved).* *fl.* white, twice as large as those of *S. arborescens*; spikelets two-flowered, twin, erect, at the tips of the branchlets; bracts velvety, the lower ones scarious-rufescent; scape tall, amply and much branched above, in a corymbose panicle. May. *l.* nearly glabrous, large, sessile, obovate-spathulate, very obtuse, the lower part long-attenuated, obsoletely sinuate. *h.* 2ft. Teneriffe, 1824. Half-hardy sub-shrub. (B. M. 4125; B. R. xxxi. 7.)

S. macroptera (large-winged). *fl.* purple; spikelets two-flowered, in fascicles of two or three at the tips of the branchlets; wings of the floral branches very broad; scape tall, ample and spreading, very broadly paniculate-corymbose. Summer. *l.* slightly puberulous, at length glabrescent, ample, coriaceous, petiolate, lyrate; terminal lobe large, ovate, slightly acute, bristle-bearing at apex, sinuate-lobed; lateral ones much smaller, confluent. *h.* about 2ft. Canary Islands. Greenhouse. (I. H. iii. 105.)

S. pectinata incompta (comb-like, inelegant). *fl.* blue; spikelets three-flowered, distichous, in oblong, sub-scorpioid, spreading, densely-imbricated spikes; lower bracts rufescent; scape leafy, decumbent. September. *l.* rosulate at the base of the scape, or fascicled or solitary near the axils of the scales, obovate, obtuse or retuse, mucronate, attenuated into the petioles. Canary Islands, 1780. A half-hardy, calcareous-dotted sub-shrub. (B. R. xxvi. 65, under name of *S. pectinata.*)

Statice—*continued.*

S. profusa (profuse).* *fl.* disposed in well-branched, corymbose heads; calyx purple; corolla white. August. *l.* radical, 6in. to 8in. long, oval or somewhat spathulate, waved, leathery, shining, and dark green; outer ones prostrate. *h.* 2ft. A greenhouse hybrid between *S. puberula* and *S. Halfordii.* (F. M. 40.)

S. puberula (puberulous). *fl.* violet, as large as those of *S. arborescens*; spikelets two-flowered, few, at the tips of the branchlets, sub-distichous and rather loosely fascicled; bracts scarious-rufescent, pubescent; scape 3in. to 5in. high, paniculately corymbose. July. *l.* ½in. to ¾in. long, ovate-rhomboid, slightly acute, bristle-bearing at apex, long-ciliated on the margins, shortly attenuated into the petioles. Graciosa, 1830. A whitish-pilose or puberulous, half-hardy sub-shrub. (B. 182; B. M. 3701; B. R. 1450.)

S. pumila alba. A mere garden name.

S. rosea (rosy).* *fl.* blue; spikelets one-flowered, clustered in short, terminal, horizontal spikes, with a flexuous rachis; bracts blackish, with white margins; scape terete, much-branched, paniculately corymbose above, tuberculate-scabrous. May. *l.* obovate-oblong, attenuated into the petioles, rough-tubercled on both sides. Stem short, leafy. *h.* 3ft. Port Natal, 1840. Half-hardy sub-shrub. (B. M. 4055, under name of *S. rytidophylla.*)

S. rytidophylla (shrivelled-leaved). A synonym of *S. rosea.*

S. sinensis (Chinese). *fl.* yellow; spikelets two-flowered, in short, sub-secund, terminal spikes; lower bracts ovate, obtuse; scape tall, dichotomously branched just above the base, corymbose-fastigiate. April. *l.* obovate-lanceolate, obtuse, long-attenuated into the petioles. Stem acutely angled. *h.* 1ft. China, 1845. Plant hardy, glabrous. (B. R. 1845, 63, and F. d. S. ii. 28, under name of *S. Fortunei.*)

S. sinuata (sinuate-leaved).* *fl.* purple, yellow; spikelets three or four-flowered; spikes short, secund, nearly horizontal, the upper branchlets densely imbricated; lower bracts reddish; scape dichotomous, paniculately corymbose, three to five-winged. August. *l.* lyrate-pinnatifid, with rounded lobes, the terminal ones bristle-bearing. *h.* 1ft. Levant, 1629. Half-hardy. See Fig. 527. (B. M. 71; S. F. G. 301.)

FIG. 528. STATICE SUWOROWI.

Statice—*continued.*

S. spathulata (spathulate-leaved). *fl.*, calyx white; corolla purple, obcordate, larger than the calyx; spikes in two rows; scape and branches perfectly round. August. *l.* radical, spathulate, obtuse, glaucous, entire. *h.* 1ft. Barbary, 1804. Hardy. (B. M. 1617.)

S. speciosa (showy). *fl.* white; spikelets three or four-flowered, in very short, scorpioid-capitate, distichous and very densely imbricated spikes; scapes densely corymbose above. July. *l.* nearly orbicular or oblong-obovate, abruptly attenuate-cuspidate, shortly narrowed at base. *h.* 1ft. South Russia, 1776. Half-hardy. (B. M. 656; L. B. C. 1336.)

S. spicata (spike-flowered). *fl.* pink or white; corolla lobes ovate; spikelets two to four-flowered; spikes terminal, or often many, sessile, cylindrical, very dense. Summer. *l.* rosulate, glabrous or slightly hairy beneath, oblong-lanceolate, long-attenuated into a short petiole, obtuse, mucronate, entire or laciniate. *h.* 6in. Asia, 1819. Hardy annual.

S. Suworowi (Suworow's).* *fl.* of a pretty lilac-colour, produced in dense, branched spikes. Summer. *l.* radical, oblong-lanceolate, entire or coarsely runcinate. Turkestan, 1883. A strikingly beautiful, hardy annual. See Fig. 528. (G. C. n. s., xx. p. 393; R. G. 1095, f. 1-2.)

FIG. 529. STATICE TATARICA.

S. tatarica (Tartarian).* *fl.* bright ruby-red, ¼in. long; spikelets sub-unilateral on the branches, one to three-flowered; scape stiff, erect, 2in. to 3in. long, soon giving off a long, broad, recurved panicle. June and July. *l.* tufted, 4in. to 6in. long, oblong, spathulate, or oblanceolate, acuminate, mucronate, rigid, glabrous, narrowed into the petioles. *h.* 1ft. South-east Europe, 1731. Hardy. See Fig. 529. (B. M. 6537.)

S. t. angustifolia (narrow-leaved). A variety with narrower leaves than the type. SYN. *S. incana* (of Bieberstein).

S. Thouini (Thouin's). *fl.* yellow; spikelets two or three-flowered; spikes secund, very short, angled, straight; scape corymbose above, more or less broadly three-winged, subdichotomous. May. *l.* sinuate or lyrate-pinnatifid, the lobes and sinuses rounded, the margins shortly ciliated. *h.* 1½ft. Teneriffe, Greece, Palestine, North Africa, &c., 1829. A half-hardy, glaucescent annual. SYN. *S. ægyptiaca* (B. M. 2363).

STATUARY. Like some other descriptions of garden furniture, Statuary requires to be associated with special accessories, in harmony with it. Statuary can seldom be introduced with entire satisfaction, except when associated with architectural or geometrical lines. Such positions may be found in terrace gardens, along the sides of long, straight walks, or as a terminal object to such walks or at places where they intersect, and sometimes, with good effect, at the end of a vista or avenue. It is seldom out of place in the conservatory, where, even should it not be introduced with faultless taste, it is less likely to absolutely offend, than a puerile attempt at rockwork

Statuary—*continued.*

and waterfall. As to the size of the groups and figures to be introduced into a given space, this must be determined on the spot; and, in order to arrive at a proper decision in so important a matter, it is a good plan to set up outlines, simply constructed of rough boards, and then to diminish or enlarge them, until they appear in harmonious proportion to the general features of the situation. The choice of subjects will be determined by the taste of the proprietor, or those whom he consults, and the expense to be incurred. When the latter does not permit of the introduction of marble or real stone, recourse may be had to the very good artificial stone or terra-cotta objects which have been found to stand the test of exposure.

It may be here remarked that Statuary, when exposed to the atmosphere, may be rendered more durable by the application of one of the patent colourless solutions sold for such purposes; but, for obvious reasons, paint should not be used.

STAUNTONIA (named after Sir George Staunton, a traveller in China). ORD. *Berberideæ.* A small genus (two species) of ornamental, hardy, evergreen, climbing shrubs, natives of China and Japan. Flowers monœcious; sepals six, petaloid, the outer ones broader; petals none; stamens six; racemes axillary, few-flowered. Leaves digitately three to seven-foliolate. One of the species is in cultivation. It thrives in sandy loam, and may be increased by cuttings of young, half-ripened shoots, inserted in sand. In autumn, the long, trailing shoots should be cut back, leaving only those from which flowers are desired.

S. hexaphylla (six-leafleted). *fl.*, white, fragrant. April. *l.* composed of six firm, deep green, elliptic-ovate, acute leaflets. 1876. (G. C. n. s., v. 597; S. Z. F. J. i. 76.)

S. latifolia (broad-leaved). A synonym of *Holbœllia latifolia.*

STAURANTHERA (from *stauros*, a cross, and *anthera*, an anther; the anthers cohere in the form of a cross). SYNS. *Anomorhegmia, Cyananthus* (of Griffiths), *Miquelia, Quintilia.* ORD. *Gesneraceæ.* A small genus (two or three species) of stove herbs, inhabiting the East Indies and the Malayan Archipelago. Flowers blue, mediocre or rather large, loosely cymose or unilaterally racemose; calyx broadly campanulate and five-cleft; corolla somewhat rotate-campanulate, with a bilabiate limb, the posterior lip bifid; perfect stamens four. Leaves ample, membranous, solitary in the nodes or opposite and stipuliform. For culture of *S. grandifolia*, the only species introduced, *see* **Klugia.**

S. grandifolia (large-leaved). *fl.* 1in. long; calyx pubescent; corolla tube white, tinged with purple and pale yellow; limb pale purple; throat white, with a deep yellow spot on the lower side; peduncles terminating in many panicles. August. *l.* often 10in. long, 4in. broad, oblong, inequilateral; petioles stout, 2in. to 4in. long. Stems and branches succulent. *h.* 1ft. Moulmein, 1862. (B. M. 5409; F. M. 272.)

STAURITIS. *See* **Stauropsis.**

STAUROGLOTTIS. Included under *Phalænopsis.*

STAUROPSIS (from *stauros*, a cross, and *opsis*, appearance; so called from the shape of the flower). Erroneously printed *Stauritis.* SYN. *Fieldia* (of Gaudichaud). ORD. *Orchideæ.* A genus comprising about eight species of stove, epiphytal orchids, natives of the Malayan Archipelago (and the East Indies?). Sepals and petals free, much-spreading; lip continuous with the column, spreading, concave, not spurred, narrow, the lateral lobes short, the middle one rather long; pollen masses two; raceme few or many-flowered; peduncles lateral. Leaves distichous, spreading, coriaceous, flat. Stem leafy, not pseudo-bulbous. For culture of the three species known to gardeners, *see* **Vanda.**

S. Batemanni (Bateman's).* *fl.* large and spreading; sepals and petals yellow, spotted with crimson in front, rosy-purple at back, fading to violet at the edge, thick and fleshy, falcate; lip purple-crimson, saccate at base, the front part furrowed and

Stauropsis—*continued.*

incurved, the disk bearing an elevated tooth, and its base a short, transverse crest; scapes long, erect, many-flowered. July to September. *l.* lorate, obtuse, and obliquely emarginate at apex, light green. Stem stout. Philippine Islands. SYNS. *Fieldia lissochiloides, Vanda Batemanni* (B. R. 1846, 59), *V. lissochiloides.*

S. fasciata (banded). *fl.* large, few in a spike; sepals and petals white, with yellowish-cinnamon bars inside, cuneate-oblong, acute; lip whitish, the tips of the side plates of the anterior part yellow, and a few purplish spots on the keel of the under side; basilar laciniæ nearly dolabriform; peduncles stalked, trigonous. *l.* cuneate-ligulate, obtusely bilobed. Eastern tropical Asia, 1872. SYN. *Trichoglottis fasciata.*

S. gigantea (gigantic). *fl.* 3in. across; sepals and petals deep yellow, with cinnamon-brown blotches, oblong, obovate; lip white, fleshy, small, incurved, channelled, dolabriform, with short, rounded, basal auricles; racemes axillary, about half as long as the leaves. Spring. *l.* bold, distichous, dark green, broadly lorate, recurved, tough, 1½ft. long, very obtuse, emarginate. Burmah, 1858. A majestic plant. SYN. *Vanda gigantea* (B. M. 5189; I. H. 277; R. X. O. ii. 112).

STAUROSTIGMA (from *stauros*, a cross, and *stigma*, a stigma; in allusion to the cross or star-shaped stigmas). Including *Asterostigma* and *Rhopalostigma*. ORD. *Aroideæ* (*Araceæ*). A small genus (six species) of stove, tuberous, stoloniferous herbs, natives of tropical America. Flowers all perfect, the males and females contiguous; spathe erect, lanceolate, convolute at base, opening or gaping above; spadix monœcious, inappendiculate, cylindrical, shorter than the spathe; peduncles many or solitary, equalling the leaves. Leaves on long petioles, hastate-cordate, pinnatisect, or once or twice pinnatipartite; pinnæ sessile, acuminate. The introduced species are described below. A well-drained compost of sandy loam and peat is most suitable. A season of rest must be allowed, during which the plants should be sparingly watered, so as not to become quite dry. Propagation may be effected by seeds, sown in bottom heat; or by division of the tubers.

S. concinnum (neat). *fl.*, spathe narrow-lanceolate, very acute; spadix white and purple, scarcely shorter than the spathe, the male part dense-flowered; peduncle livid-purple, shorter than the petioles. *l.*, young ones reniform, pedatisect, the segments obovate-lanceolate; adults three-parted, the middle part pinnatisect, elongated-oblong, the lateral parts cymosely bi- or trisected; petioles nearly as long as the blades, marked with pale violet and dark purple. *h.* 1½ft. Brazil, 1860. (L. B. C. 1590, under name of *Caladium luridum.*)

S. c. colubrinum (snake-like). *fl.*, spathe greyish-green, marked with red and brownish-purple; spadix pale greenish and dirty-scarlet. Rio Janeiro, 1860.

S. c. Langsdorffii (Langsdorff's). *fl.*, spathe glaucous-green outside, livid or dirty-brown within; spadix rose-violet. *l.*, petioles green, more or less conspicuously spotted with white. *h.* 1½ft. Rio Janeiro, 1860.

S. c. lineolatum (lined). *fl.*, spathe greyish-green outside, with ochraceous stripes, brownish-purple within; spadix dirty-yellowish and rose-colour. *h.* 1½ft. Rio Janeiro, 1860.

S. Luschnathianum (Luschnath's). *fl.*, spathe deep green within and speckled with brown, reticulated externally, 2in. to 4in. long, erect, cylindric, acute; spadix cylindric; anthers scarlet; ovaries white; scape similar to the petiole. *l.* 1ft. to 2ft. long, deep green, pinnatifid, broadly ovate; two lower segments deflexed, deeply cut into three to five lobes; remaining segments four to six pairs, sessile, remote, irregularly sinuate-lobed or entire; petioles 6in. to 12in. long, whitish, with black-purple streaks. Rio Janeiro. (B. M. 5972, under name of *Asterostigma Luschnathianum.*)

S. Riedelianum (Riedel's). *fl.*, spathe yellowish, greenish outside; spadix slender, one-third shorter than the spathe; peduncles many, variegated. *l.*, adults three-parted; middle part pinnatisect, the segments linear-oblong, sessile, abruptly and rather long-cuspidate at apex; lower lateral ones shortly decurrent; peduncles spotted and variegated, scarcely longer than the blades. *h.* 2ft. Bahia, 1860.

STAVESACRE. *See* **Delphinium Staphysagria.**

STEAM, HEATING BY. A method of heating plant structures, which has been almost or entirely superseded by that of hot water. Most of the systems of heating now adopted in gardens, are described under **Heating** (which *see*).

STEEL-BLUE SIREX. *See* **Sirex.**

STEENHAMMERA. A synonym of **Mertensia** (which *see*).

STEGNOGRAMME. Included under *Polypodium.*

STEGOSIA. A synonym of **Rottboellia** (which *see*).

STELEPHUROS. A synonym of **Phleum** (which *see*).

STELIS (the old Greek name used by Theophrastus for some parasitical plant). ORD. *Orchideæ.* A large genus (about 150 species have been described) of stove, epiphytal orchids, inhabiting tropical America, from Brazil and Peru, as far as Mexico and the West Indies. Flowers small, sometimes minute, shortly pedicellate, in terminal, elongated racemes, rarely sub-distichous; sepals spreading, more or less connate; petals much shorter, broad, with thickened margins, often nearly including the column and lip; lip sessile at the base of the column, resembling the petals, or narrowed and occasionally three-lobed; pollen masses two; bracts alternate, often distichous. Leaves coriaceous, often contracted into the petioles. Stems tufted, or creeping with simple branches, one-leaved at apex, often with one to three sheaths below the leaves, not pseudo-bulbous. Few of the species have any attraction on the score of beauty; but many of them are very interesting. A selection of those best known to cultivators is given below. For culture, *see* **Pleurothallis.**

S. atropurpurea (dark purple). A synonym of *S. ciliaris.*

S. Bruckmülleri (Bruckmüller's).* *fl.* yellowish-purple outside, pale purple within, disposed at intervals of ⅛in. along the rachis; sepals broadly ovate, acute, united at base, clothed with spreading hairs within; petals and lips very minute, the latter undivided; racemes two or three times as long as the leaves. December. *l.* 1½in. to 2in. long. Probably Mexican Andes. (B. M. 6521.)

S. canaliculata (channelled). *fl.* dull yellowish-green, very small, secund, disposed in a dense raceme; bracts and rachis whitish. *l.* cuneate-oblong, obtuse, thick, plainly channelled in the middle. *h.* 8in. Bogota, 1872.

S. ciliaris (ciliated).* *fl.* deep purple, with long fringes to the ovate sepals; petals oblate-rhomboid, fleshy; lip ovate, fleshy, channelled at base; spike naked half-way up, then closely covered with flowers. February. *l.* broadly oblong, narrowed at base. *h.* 6in. Mexico, 1842. SYN. *S. atropurpurea* (B. M. 3975).

S. Endresii (Endres'). *fl.* greenish-white; sepals coalescing towards the base; lip fleshy, transversely sub-rhomboid, excavated; raceme distichous. December and July. *l.* cuneate, oblong-ligulate, obtuse, emarginate and apiculate, thick. Costa Rica, 1870.

S. glossula (small-tongued). *fl.* brownish, standing in two transverse rows, the upper sepal having a much longer extent than the whole of the other organs of the flower together; lip fleshy, papuliform. *l.* cuneate, oblong-ligulate, minutely bilobed, with a small tooth at apex. Costa Rica, 1870. Plant densely tufted.

S. grandiflora (large-flowered). *fl.* chocolate-coloured, among the largest of the genus; sepals equal, obtuse; petals ovate; lip ovate, concave, emarginate; spike dense; spathe large, acuminate. July. *l.* oblong, petiolate, emarginate, 4½in. long, 1in. broad. Stem 3in. high. Brazil, 1836.

S. grossilabris (large-lipped). *fl.* light greenish, small; lip thick and fleshy; racemes shorter than the leaves. *l.* cuneate, spathulate, obtuse. Native place unknown. 1881. Plant tufted.

S. micrantha (small-flowered). *fl.* whitish, red within, nodding, one-sided-distichous; sepals deltoid; petals and lip truncate; raceme slender, spike-formed. April. *l.* lanceolate-oblong, rather blunt, contracted and tapering at base, 1in. to 2½in. long. *h.* 3in. to 6in. Jamaica, 1805. (H. E. F. 158; L. B. C. 1011; S. E. B. 75.)

S. ophioglossoides (Ophioglossum-like). *fl.* greenish, with a tinge of purple, minute; raceme slender, one-sided, pedunculate. September. *l.* 2½in. to 6in. long, oblong-linear, rather blunt, long-tapering at the base. Stem shorter than the leaves. West Indies, 1791. (B. R. 935; L. B. C. 442.)

S. sesquipedalis (foot-and-a-half). *fl.* pale yellow, secund, large; sepals roundish-ovate, obtuse; petals oblate; lip conformed, cucullate; spike 7in. to 10in. long. August. *l.* broadly oval, shortly petiolate, 1½in. to 4in. long. *h.* 6in. Sierra Nevada, 1845.

S. zonata (zoned). *fl.* light ochre; sepals brown at the base; petals with a mauve middle zone; raceme one-sided. *l.* very thick, cuneate-oblong, blunt. Stem short. Demerara, 1884.

STELLARIA (from *stella*, a star; alluding to the flowers). Starwort; Stitch Grass; Stitchwort. Including *Larbrea*, *Malachium*, *Micropetalon*, and *Spergulastrum*. ORD. *Caryophylleæ*. A genus comprising about seventy species of usually diffuse herbs, broadly dispersed over the globe, seven being natives of Britain. Flowers white, small, in dichotomous cymes; sepals and petals five, rarely four; stamens ten, rarely eight, five, or three. Leaves narrow or broad. *S. media* is the common Chickweed. *S. Holostea* is one of our early hedge-flowers. The species thrive in ordinary soil, but have little value as garden plants.

S. graminea aurea (golden grass-like). *fl.* white, many, ½in. to ¾in. in diameter; petals equalling the three-nerved sepals. May to August. *l.* very narrow, sessile, ciliate, pale golden-yellow. Stem 1ft. to 3ft. long, sub-erect, four-angled. (The green-leaved type is found in Europe (Britain), Siberia, Western Asia to the Himalayas.) A perennial, sometimes used in carpet-bedding.

FIG. 530. TOP OF PLANT OF STELLARIA HOLOSTEA.

S. Holostea (Holostea). Adder's Meat; Greater Stitchwort; Moon Flower; Satin Flower, &c. *fl.* white, ½in. to ¾in. in diameter, on slender pedicels; petals twice as long as the almost nerveless sepals. April to June. *l.* sessile, connate, lanceolate, 1in. to 4in. long, acuminate, rigid, ciliated. Stem 1ft. to 2ft. long, decumbent at base, brittle at the nodes, hairy above. Europe (Britain). Perennial. See Fig. 530. (Sy. En. B. 230.)

STELLATE. Star-shaped.

STELLERA (named in honour of G. W. Steller, 1709-1746, a celebrated Russian botanical collector). ORD. *Thymelæaceæ*. A small genus (eight species have been described, but not more than six are really distinct as such) of hardy, perennial herbs, sub-shrubs, or shrubs, natives of Central and Western Asia. Flowers hermaphrodite, sessile at the tips of the branches, capitate or densely spicate; perianth tube cylindrical, at length cut round above the ovary; lobes four, rarely five, spreading; stamens eight, rarely ten. Leaves alternate, flat. It is doubtful whether the under-mentioned species are still cultivated. Both are perennial herbs, thriving in ordinary soil; they may be multiplied by divisions.

S. altaica (Altaian). *fl.* white; lobes four; stamens eight; head ovoid, ten to fifteen-flowered, at length elongated into an oblong, leafless spike, about 1in. long. July. *l.* lanceolate or oblong, slightly acute, about 1in. long. Stems slender, many from the rhizome, erect or ascending. *h.* 1ft. Altai, 1824.

S. Chamæjasme (ground Jessamine). *fl.* white; lobes five; stamens ten; head six to fifteen-flowered. June. *l.* lanceolate or oblong, slightly acute, five to ten lines long. Stems often numerous from a thick rhizome, slender. *h.* 1ft. Siberia, 1817.

STEM. That part of a plant which supports the leaves and (in flowering plants) the flowers. It is always present in Vascular plants, though occasionally so extremely ill-developed that the plants are called *acaulescent* or stemless; but, in such plants, the top of the so-called root is, in truth, the stem. In the Algæ, Fungi, and Lichens there is no real distinction into Stems and leaves, the two being replaced by the thallus. In most plants, the Stem usually rises upwards towards light, contains chlorophyl, is covered with true epidermis, with stomata, and bears leaves and buds at the nodes—standing in marked contrast, in all these points, to roots, though exceptions occur to all of the characters mentioned. Stems vary from ½in. or less (*Centunculus minimus*) to 470ft. in height (*Eucalyptus amygdalina*), and from extreme slenderness (*e.g.*, in *Radiola millegrana*) to the enormous trunks of the Sequoias in Western America, whose girth is many yards.

It would occupy too much space to enter into details of the wide differences in habit met with in Stems, due to variation in thickness, branching (whether with or without a main stem), direction, and many other characters. A reference to the figures under such headings as **Agave, Cactus, Coreopsis, Fragaria, Hedera, Palmæ, Pinus,** &c., will give a better idea of these differences than any brief description could.

Internal structure of Stems also varies greatly; but there are two well-marked types in woody Stems, after the first year of growth. The one is characteristic of Dicotyledons and Conifers, and the other of Monocotyledons. In the former, there is the appearance, in cross-section, of as many rings of wood as the Stem is years old, due to the wood formed in autumn being closer in texture than that of spring, and therefore differing from it in appearance. There is also a well-marked bark, separated from the wood by a well-developed cambium, or layer, where growth in thickness is effected. In most Dicotyledons there is also pith in the centre of the Stem, and lines of cellular tissue, named medullary rays, run towards the circumference from the girth, and cut the wood into wedge-shaped masses. In the Monocotyledons, on the contrary, the Stems, in transverse section, show no appearance of layers, the bundles of woody fibres lying imbedded amongst cellular tissue, in which no separation into pith and bark is observable. In these Stems there are no annual rings, no medullary rays, no cambium, and no true bark; and the Stem, after it is once formed, does not increase in thickness, but only in length.

Certain forms of Stems have received special names, of which the following are among the more important: Caudex, applied to the columnar, erect Stems of Palms and Tree-ferns, marked with the bases of the leafstalks, or with their scars; Culm, the cylindrical, jointed Stems of Grasses and allied plants, which usually have hollow internodes; Scape, a leafless, erect stem, ending in a flower or group of flowers. Decumbent lateral stems, or branches, receive the following names: Runner, when slender, lying on the surface of the soil, and emitting roots at the nodes; Stolon, resembling a runner, but forming erect Stems from the terminal buds, which tend to form new plants; Offset, a short stolon; Sucker, an underground stolon.

Stems are occasionally much modified to serve peculiar functions. Among the most remarkable of such modifications are Spines and Tendrils. The former are branches or main Stems that have remained short, but

Stem—*continued.*

have the woody tissues largely developed, so that they are very strong and rigid, and, ending in sharp points, form an efficient protection against injury from animals. Examples of Stem-spines are seen in the Blackthorn, the Hawthorn, and many other shrubs. Tendrils, in a few plants (*e.g.*, Passion-flower and Vine), are very slender Stems that have the power of twining round firm supports in a continuous spiral from right to left, or from left to right. Twining Stems form a transition between tendrils and ordinary Stems.

STEMLET. A diminutive stem.

STEMMATIUM. A synonym of **Tristagma** (which *see*).

STEMODIA (from *stemon*, a stamen, and *dis*, double; alluding to the anthers, which consist of two separate cells). SYN. *Unanuea.* Including *Matourea.* ORD. *Scrophularineæ.* A genus comprising about twenty-six species of stove, greenhouse, or half-hardy, often aromatic herbs, sometimes sub-shrubs, inhabiting tropical and Southern extra-tropical America, tropical Africa and Asia, and Australia. Flowers generally bluish, solitary in the axils, or the upper ones clustered in leafy or bracted spikes; corolla tube cylindrical, the upper lip broad, entire or emarginate, the lower one spreading or three-lobed; stamens four, didynamous; anthers two-celled. Leaves opposite, or in whorls of three or four. Only two species call for description here. These thrive in any rich, moist soil, and may be readily multiplied by division of the roots.

S. chilensis (Chilian). *fl.*, corolla nearly twice as long as the calyx, the lower lip glabrous; spikes terminal, leafy, at length elongated and interrupted. September. *l.* oblong or lanceolate, 1in. to 2in. long, unequally serrated, acute, cordate-amplexicaul or auriculate at base. Stem above 1ft. high, branched above. Chili, 1829. Plant very viscous, half-hardy. (B. R. 1470.)

S. lobelioides (Lobelia-like). *fl.* of an intense blue; corolla nearly twice as long as the calyx, but smaller than in *S. chilensis*; spikes terminal, somewhat panicled, leafy, at length slightly elongated. August. *l.* oblong-lanceolate, acute, unequally serrated, narrowed towards the base, and often dilated-amplexicaul. *h.* 1ft. Brazil, 1830. Plant glabrous, half-hardy. (B. M. 3134, under name of *Gratiola tetragona.*)

STEMONA (from *stemon*, a stamen; in allusion to the foliaceous stamens). SYN. *Roxburghia.* ORD. *Roxburghiaceæ.* A small genus (four or five species) of interesting, stove climbers, natives of the East Indies, the Malayan Archipelago, and tropical Australia. Flowers rather large, handsome, but fœtid, on axillary, one or few-flowered peduncles; perianth segments four, distinct, biseriate, erect, acuminate; stamens nearly hypogynous. Leaves alternate, lanceolate, ovate, or cordate, rather shining, with thick, transverse veinlets; petioles inarticulate. Perhaps the only species in cultivation is that described below. It thrives in light, turfy loam, and may be readily increased by suckers.

S. gloriosoides (Gloriosa-like). *fl.* green, campanulate, glabrous; perianth segments narrow, acuminate; peduncles solitary, racemosely one to three-flowered. July. *l.* scattered, very rarely nearly opposite, ovate-lanceolate, loosely cordate, acuminate, slightly mucronate, 4in. to 6in. long. *h.* 6ft. East Indies, 1803. SYNS. *Roxburghia gloriosa* (B. M. 1500), *R. viridiflora* (S. E. B. 57).

STEMONACANTHUS. Included under *Ruellia.*

STENACTIS SPECIOSA. A synonym of **Erigeron speciosus** (which *see*).

STENANDRIUM IGNEUM. A synonym of *Chamæranthemum igneum.*

STENANTHERA (from *stenos*, narrow, and *anthera*, an anther; the filaments are broader than the anthers, which causes the latter to appear narrow). ORD. *Epacrideæ.* A small genus (two species) of beautiful, greenhouse, evergreen shrubs, now included, by Bentham, under *Astroloma*; both are natives of Australia. Flowers axillary, solitary; corolla tube without tufts of hairs or fringed scales inside; filaments much flattened. Leaves linear, with revolute margins. The species thrive best in a compost of one-third sandy loam, and two-thirds very sandy peat. The fine roots of the plants are injured by the application of much water; consequently, ample drainage must be provided in the pots. Propagation may be effected by cuttings, taken from the young shoots, and inserted in sand, under a glass, in heat.

S. ciliata (ciliated). *fl.* red, almost sessile; sepals obtuse; corolla tube nearly or quite ¾in. long; bracts very small. April. *l.* spreading, linear, tapering into a short point, serrulate-ciliated, convex, with recurved margins, crowded and ¼in. long, or more distant and ½in. long. Stems prostrate or diffuse. 1836. The correct name of this plant is *Astroloma longiflorum.*

S. pinifolia (Pine-leaved).* *fl.* sessile and solitary in each axil, but often crowded at the bases of the branchlets; bracts several, inner ones ¼in. to ⅓in. long; corolla about ¾in. long, reddish at base, passing into yellow, with green tips. May. *l.* crowded, very narrow-linear, rigidly pointed, with revolute, scabrous margins, about ½in. long. *h.* 2ft. to 3ft. (or small and diffuse). 1811. (B. R. 218.)

STENANTHIUM (from *stenos*, narrow, and *anthos*, a blossom; alluding to the narrow perianth segments and panicles). ORD. *Liliaceæ.* This genus embraces five species of greenhouse or hardy, bulbous plants, of which one is a native of North-west Asia, and the rest are North American. Flowers racemose or paniculate, often nodding, pedicellate; perianth whitish, greenish, or dark purple, narrowly or broadly campanulate, the segments connate in a very short, turbinate tube, spreading above, narrow or lanceolate; stamens six; bracts small or minute. Leaves radical or at the base of the stem, long, linear or linear-lanceolate. Stem erect, tall, simple except the inflorescence, sometimes furnished with a few small leaves. Only three species call for mention here. They thrive in a mixture of sandy loam and peat, and may be increased by division. All are North American.

S. angustifolium (narrow-leaved). *fl.* greenish-white, the lower ones often sterile, nearly sessile; perianth about ⅓in. in diameter; panicle 1ft. to 2ft. long, ⅓in. to ½in. broad, composed of simple, spiked racemes. June and July. *l.* channelled, 1ft. to 2ft. long. Stem 2ft. to 3ft. high. Hardy.

S. a. gramineum (Grass-like). *fl.* fewer than in the type. *l.* narrower. SYN. *Helonias graminea* (B. M. 1599).

S. frigidum (frigid). *fl.*, perianth purplish, ½in. to ⅔in. long; racemes lateral, ascending, few-flowered; panicle loose, 1ft. long. June. *l.*, radical ones five or six, firm, linear, acute, glabrous, 2ft. long. Stem 2ft. to 3ft. high, with a few reduced leaves. 1846. Hardy. (F. d. S. 468L; J. H. S. i. 32.)

S. occidentale (Western). *fl.* dark purple, somewhat resembling those of a Hyacinth, campanulate, disposed in a loose raceme. Summer. *l.* two to four, linear. Stem slender, furnished with a few reduced leaves. 1881. Hardy. (R. G. 1035, f. 3, and 1132, f. 1.)

STENIA (from *stenos*, narrow; alluding to the form of the pollen masses). ORD. *Orchideæ.* A small genus (three species) of stove, epiphytal orchids, natives of Guiana, Columbia, and Peru. Flowers rather large; sepals of equal length, spreading, the lateral ones rather broader, adnate at base to the foot of the rather thick, erect column; petals similar to the dorsal sepal; lip continuous with the foot of the column, fleshy, broad, nearly saccate, the lateral lobes small, the middle one undivided, or all broader and fimbriate, the disk crested; pollen masses four, oblong-linear; scapes short, recurved, one-flowered. Leaves oblong or narrow, coriaceous. Stems shortened. Pseudo-bulbs clustered, one or two-leaved. For culture, *see* **Maxillaria.**

S. fimbriata (fringed). *fl.* light yellow, membranous, marked at the base of the elegantly-fringed lip with brownish-purple dots; peduncles erect. *l.* cuneate-oblong, acute. Columbia, 1869. SYN. *Chondrorhynca fimbriata* (Ref. B. 107).

S. guttata (spotted). This species is closely related to *S. pallida*, but differs in having blunter sepals and petals, with spots of purple on a straw-coloured ground, and in the lip being blotched and having only seven callous teeth. Peru, 1880.

S. pallida (pale). *fl.* pale citron-colour, 1½in. or more in diameter; sepals and petals linear, acute; lip spotted with red, saccate, entire, fleshy, ovate; scapes radical, prostrate. August to October. *l.* two to five, oblong, acute, slightly narrowed and keeled at base, sheathed with brownish, spathaceous scales. Stem wanting. Demerara, 1837. (B. R. 1838, 30.)

STENOCARPUS (from *stenos*, narrow, and *karpos*, a fruit; alluding to the usually nearly flat follicles). SYNS. *Agnostus*, *Cybele*. ORD. *Proteaceæ*. A genus comprising fourteen species of stove or greenhouse trees, of which three are Australian and the rest New Caledonian. Flowers yellow, white, or red, umbellate, hermaphrodite, slightly irregular; perianth tube elongated, opening along the lower side; limb sub-globose, recurved, the segments at length separating; anthers sessile within the concave lamina; bracts small and highly caducous, or absent. Leaves alternate or scattered, entire or deeply pinnatifid with few lobes. Only three of the species have been introduced. For culture, *see* **Lomatia**.

S. Cunninghamii (Cunningham's). A synonym of *S. sinuatus*.

S. Forsteri (Forster's). *fl.* white; perianth four to five lines long; pedicels longer than the perianth; umbels solitary, six to eight-flowered; peduncles terminal, equalling the leaves. June. *l.* oblong, obtuse, attenuated and slightly petiolate, entire, ten to eighteen lines long, three to six lines broad, almost veinless. Branches terete; branchlets slender. *h.* 3ft. New Caledonia, 1850. (L. & P. F. G. ii. p. 166.)

S. salignus (Willow-like). Beef Wood. *fl.* greenish; perianth usually under ½in. long; pedicels ⅓in. to ½in. long, irregularly crowded; peduncles slender, terminal or in the upper axils, usually shorter than the leaves, bearing a single umbel of ten to thirty flowers. June. *l.* ovate-lanceolate or elliptic, acute, acuminate, or rarely obtuse, 2in. to 4in. long, tapering into short petioles. *h.* 5ft. or more. Australia, 1719. (B. R. 441.)

S. sinuatus (sinuate).* Fire-tree or Tulip-tree of Queensland. *fl.* bright red; perianth tube 1in. or more long, straight, tapering upwards; peduncles terminal, 2in. to 4in. long, each bearing an umbel of twelve to twenty flowers, and either generally umbellate or shortly racemose. June. *l.* petiolate, either undivided, oblong-lanceolate, and 6in. to 8in. long, or pinnatifid and above 1ft. long, with one to four oblong lobes on each side. *h.* (in Australia) 60ft. to 100ft. 1830. SYN. *S. Cunninghamii* (B. M. 4263; F. d. S. iii. 7; P. M. B. xiv. 1).

STENOCHILUS (from *stenos*, narrow, and *cheilos*, a lip; alluding to the narrow lip of the flower). ORD. *Myoporineæ*. A genus comprising eight species of pretty, little, greenhouse, evergreen, Australian shrubs, now included, by the authors of the "Genera Plantarum," under *Eremophila*. Calyx segments five, imbricated at base, usually enlarged after flowering; four upper lobes of corolla short and acute, the fifth lowest more deeply separated and sometimes narrow; stamens four (with one exception), exserted. Leaves alternate or scattered. The two best-known species are here described. They thrive in sandy peat, and may be increased by cuttings, inserted in sand, under a glass.

S. glaber (glabrous). *fl.* yellow, red, or with these colours variously mixed; corolla glabrous, or slightly pubescent outside, nearly or quite 1in. long, the tube constricted above the ovary; pedicels solitary. April. *l.* lanceolate, or rarely elliptic-oblong or cuneate, acute or obtuse, entire or slightly serrulated, usually ¾in. to 1in. long. *h.* 3ft. 1803. (B. M. 1942; B. R. 572.) SYNS. *S. incanus*, *S. viscosus* (B. M. 2930). The correct name of this plant is *Eremophila Brownii*.

S. incanus (hoary). A synonym of *S. glaber*.

S. maculatus (spotted). *fl.* red, more or less variegated with yellow, or quite yellow, solitary; corolla 1in. or more long, the lowest lobe separated to below the middle. April. *l.* mostly lanceolate, occasionally varying from elliptic-oblong to linear, acute or obtuse, entire, above 1in. long. *h.* 3ft. 1820. (B. R. 647.) The correct name of this plant is *Eremophila maculata*.

S. viscosus (clammy). A synonym of *S. glaber*.

STENOCHLÆNA. Included under *Acrostichum* and *Lomaria*.

STENOCORYNE (from *stenos*, narrow, and *koryne*, a club; alluding to the club-shaped spur of the lateral sepals). ORD. *Orchideæ*. A monotypic genus. The species is a stove, epiphytal orchid, now regarded, by Bentham and Hooker, as a member of the genus *Bifrenaria*. For culture, *see* **Maxillaria**.

S. longicornis (long-horned). *fl.* orange, spotted with brown; lateral sepals ovate, acute, extended into a long, slender, clavate spur; lip long, unguiculate, three-lobed at apex; raceme loose, many-flowered. April. *l.* oblong-lanceolate, sub-plicate, shining. Pseudo-bulbs elongated, tetragonal. *h.* 1ft. Demerara, 1843.

STENOGASTRA. Included under **Sinningia** (which *see*).

STENOGLOSSUM (from *stenos*, narrow, and *glossa*, a tongue; alluding to the long, narrow labellum). ORD. *Orchideæ*. A monotypic genus. The species is a stove, epiphytal orchid, having racemose flowers and narrow leaves, allied to *Epidendrum*. It is a native of the Andes of tropical America, and is not yet known to cultivation in this country.

STENOGLOTTIS (from *stenos*, narrow, and *glotta*, a tongue; alluding to the narrow lip). ORD. *Orchideæ*. A monotypic genus. The species is a greenhouse, terrestrial orchid, allied to *Habenaria*. It thrives in a compost of loam and rotten leaves, with the addition of small pieces of decayed wood and charcoal. The temperature of an intermediate house is most suitable. Water must be plentifully supplied during the growing season. Propagation may be effected by division.

S. fimbriata (fringed). *fl.* rosy-pink, rather small, scattered on a slender spike, sub-secund; sepals free, sub-equal, at length spreading; petals similar, but smaller; lip spreading from the column, narrow, as long as the sepals, trifid at apex, not spurred; column very short. *l.* clustered at the base of the stem, oblong. Root tuberous, or consisting of fascicled, fleshy fibres. South Africa, 1871. (B. M. 5872.)

STENOLOMA. Included under **Davallia** (which *see*).

STENOMESSON (from *stenos*, narrow, and *messon*, middle; alluding to the shape of the perianth). Including *Callithauma*, *Chrysiphiala*, *Clitanthus*, *Coburgia*, *Neæra*, and *Sphærothele*. ORD. *Amaryllideæ*. This genus comprises, according to Mr. Baker, nineteen species of stove or greenhouse, bulbous plants, natives of tropical America. Flowers many in an umbel, very rarely reduced to one, often on pendulous, recurved pedicels; perianth red, orange, or fulvous, showy; tube elongated, sub-cylindrical, often slightly contracted above the base or towards the middle; lobes sub-equal, erect or more or less spreading; stamens erect, connected on a six-toothed corona; involucral bracts two, broad or narrow. Leaves appearing with the flowers, linear or rather broad, loriform. Except where otherwise indicated, the under-mentioned species require greenhouse heat. For culture, *see* **Hippeastrum**.

S. aurantiacum (orange). *fl.* nodding; perianth yellow, the segments ovate, erect; stamens included; bracts shorter than the pedicels; umbels two-flowered. May. *l.* ligulate, with revolute margins. *h.* 1ft. Quito, 1843. (B. R. 1844, 42, and R. H. 1883, p. 396, under name of *S. Hartwegii*.)

S. coccineum (scarlet).* *fl.* four to eight in an umbel, drooping; perianth bright crimson, 1½in. long, the oblong-lanceolate segments half as long as the tube; scape 1ft. or more high, firm, terete. May. *l.* four or five, 1ft. or more long, moderately fleshy. Peruvian Andes, 1850. (Ref. B. 309.) SYN. *Coburgia coccinea* (B. M. 3865).

S. croceum (yellow). *fl.* nearly erect, four in an umbel; perianth golden, 1½in. long, the tube curved, the limb segments connivent; bracts 1in. long, marcescent; scape 1ft. long, terete, glaucous. May. *l.* linear-lanceolate or oval-lanceolate, solitary, green above, whitish beneath. Peru, 1820. (B. M. 2641, under name of *S. flavum* B. R. 778, under name of *Chrysiphiala flava*.)

S. curvidentatum (curved-toothed). *fl.* shortly pedicellate; perianth golden, pale greenish below, 1½in. long, curved, the segments reflexed, obtuse; coronal teeth recurved; bracts ½in. long, marcescent; scape terete, 6in. long, two-flowered. May. *l.* lanceolate-oval, compressed, sub-acute. Peru, 1842. (B. M. 2640.)

S. Hartwegii (Hartweg's). A synonym of *S. aurantiacum*.

S. humilis (dwarf). *fl.*, perianth scarlet, nearly 3in. long, the tube cylindrical, enlarged above, the limb somewhat spreading; scape one-flowered. March. *l.* green, glabrous, shining, sub-acute, slightly channelled, nearly 1ft. long, and about ¼in. broad. Cordilleras, 1841. SYN. *Coburgia humilis* (B. R. 1842, 46).

S. incarnata (flesh-coloured).* *fl.* very shortly pedicellate; perianth variable in colour, usually red, nearly 5in. long, glabrous, the segments ovate-elliptic, slightly obtuse, spotted, nearly 1in long; scape four or five-flowered, erect, about 2ft. high. August *l.* linear, narrowed above, obtuse, entire, succulent, reticulate-nerved, glabrous, erect, 1½ft. long, 1in. broad. Quito, 1826. (R. G. 1147.) SYN. *Coburgia incarnata* (S. B. F. G. ser. ii. 17). The following so-called species are regarded, by Mr. Baker, as "apparently only, in a broad sense, varieties differing principally in the colour of the flower":

S. i. fulvum (fulvous). *fl.*, perianth tawny, 4½in. long; bracts persistent; scape above 2ft. long. *l.* about six, linear-ligulate,

Stenomesson—*continued*

1½ft. or more long. SYN. *Coburgia fulva* (B. M. 3221; B. R. 1497).

S. i. trichromum (three-coloured). *fl.*, perianth tube scarlet, 4¾in. long, slightly curved; limb segments green above the middle, paler within. *l.* glaucous, obtuse, sub-erect. SYN. *Coburgia trichroma* (B. M. 3867 and 5686).

S. i. versicolor (various-coloured). *fl.*, perianth varying in colour from scarlet to whitish-fulvous, the lower part curved, 1in. long, the upper part ventricose, 1½in. long; limb 1in. long, the segments acute, spotted with green outside, whitish within. *l.* 2½ft. long, 2in. broad. SYN. *Coburgia versicolor* (B. R. xxviii. 66).

S. latifolium (broad-leaved). *fl.* shortly pedicellate, nearly erect; perianth orange-yellow, the tube cylindrical-infundibular, the segments spreading-recurved; scape umbellately five-flowered, green. March. *l.* petiolate, lanceolate-oblong, acuminate, narrowed into the petioles, striate-nerved. *h.* 1ft. Lima, 1837. Stove. (B. M. 3803.)

S. luteo-viride (yellowish-green). *fl.* five or six in an umbel, on very short pedicels; perianth tube greenish-yellow, cylindrical, 2in. to 3in. long, the segments yellow, with a distinct, green keel, 1in. long; corona green, ½in. long; scape 1½ft. long. Spring. *l.* about four, linear-lorate, glabrous, 1ft. long, 1in. broad, narrowed gradually to the point. Andes, 1878. (B. M. 6508.)

S. pauciflorum (few-flowered). *fl.* two to an umbel, one sessile, the other pedicellate, nearly erect; perianth yellow, nearly 2in. long, contracted above the middle, the segments green at back, concave, lanceolate, rigid; stamens exserted; scape glaucous. May. *l.* lanceolate, narrowed at both ends, petiolate. *h.* 1ft. Peru, 1822. SYN. *Chrysiphiala pauciflora* (H. E. F. 132).

S. Pearcei (Pearce's). *fl.* six to eight in an umbel; perianth greenish-yellow, cernuous, funnel-shaped, the segments primrose-yellow, tinged externally with green, oblong, erecto-patent; pedicels 2in. to 4in. long; scape 2½ft. to 3ft. high, firm, slightly compressed. May. *l.* lorate-lanceolate, 1½ft. long, narrowed gradually upwards to an acute point, and downwards into a flattened petiole 2in. to 3in. long, the edges rather revolute. Andes of Bolivia, 1872. (Ref. B. 308.)

S. Stricklandi (Strickland's). *fl.* five or six in an umbel; perianth bright red, the segments longer than the tube. Spring. *l.* petiolate, oblong-lanceolate. Andes of Ecuador, 1882.

S. suspensum (suspended). *fl.* four to six, drooping, on pedicels about 1in. long; perianth bright scarlet, 1½in. long, the tube half its length, the divisions ½in. deep; spathe two-leaved, 1½in. long; scape firm, erect, naked, 1ft. high. May. *l.* two, linear, acute, 1ft. long, ½in. broad, fleshy. Peru, 1865. (Ref. B. 22.)

S. viridiflorum (green-flowered). *fl.*, perianth green, very pretty; peduncle short; bracts marcescent, deciduous; scape erect, 6ft. high, terete, smooth. May. *l.* long, flat, ensiform, about ¾in. broad, erecto-patent, diverging. Peru, 1839. SYN. *Callithauma viridiflorum* (B. M. 3866).

S. vitellinum (yolk-of-egg-coloured).* *fl.* on short pedicels, six in an umbel; perianth yellow, with erect segments; stamens exserted; scape 7in. long, glaucous. April. *l.* obovate-oblong, three-nerved, petiolate, recurved at the margins, glaucous beneath. *h.* 1ft. Lima, 1842. Stove. (B. R. 1843, 2.)

STENOPTERA (from *stenos*, narrow, and *pteron*, a wing; alluding to the linear, contracted inner segments of the perianth). SYN. *Porphyrostachys*. ORD. *Orchideæ*. A small genus (three species) of stove, terrestrial orchids, natives of the mountains of tropical America. Flowers showy or mediocre, in a dense or slender spike. Leaves clustered at the base of the stem. The species are unknown to cultivation.

STENORHYNCHUS. Included under **Spiranthes** (which *see*).

STENOS. This term, used in Greek compounds, signifies narrow; *e.g.*, Stenophyllum, narrow-leaved.

STENOSEMIA. Included under **Acrostichum** (which *see*).

STENOSOLENIUM. A synonym of *Arnebia*.

STENOSPERMATION (from *stenos*, narrow, and *spermation*, a diminutive of *sperma*, a seed; in allusion to the slender seeds). ORD. *Aroideæ* (*Araceæ*). A genus consisting of about seven species of stove herbs or sub-shrubs, natives of tropical America. Flowers all hermaphrodite; spathe navicular, convolute, at length opening, wholly deciduous; spadix long-stipitate, inappendiculate, much shorter than the spathe, cylindrical; peduncle terminal, straight. Leaves distichous, coriaceous, lanceolate, acuminate; petioles short or elongated, sometimes sheathing along their whole length. Caudex elongated, creeping, or rooting at the nodes. *S. pompayanense*, the only

Stenospermation—*continued.*

species introduced, requires culture similar to **Spathiphyllum** (which *see*).

S. pompayanense (Pompayan). *fl.*, spathe ivory-white, boat-shaped, long-cuspidate; spadix suffused with white, about 2in. long. *l.* elliptic-oblong or oblong-lanceolate, slightly obtuse at base; petioles half to three-quarters the length of the blades, sheathed above the middle. Caudex ascending. *h.* 1ft. Pompayan Andes, 1875. Evergreen perennial. SYNS. *S. Wallisii* (B. M. 6334 and G. C. 1875, 116-7), *Spathiphyllum Wallisii*.

S. Wallisii (Wallis'). A synonym of *S. pompayanense*.

STENOSTEMUM. A synonym of **Stenostomum** (which *see*).

STENOSTOMUM (from *stenos*, narrow, and *stoma*, a mouth; alluding to the shape of the flowers). SYNS. *Stenostemum, Sturmia*. ORD. *Rubiaceæ*. A small genus (about five species) of pretty, small, stove, evergreen trees, natives of the West Indies, now included, by Bentham and Hooker, as a section of the genus *Antirrhœa*. Flowers white, small, cymose; calyx five-toothed; corolla funnel-shaped, five-lobed; stamens five; peduncles axillary. Leaves opposite, oval or oblong, shortly petiolate; stipules at length deciduous. For culture of the two species introduced, *see* **Hamiltonia.**

S. lucidum (clear). *fl.* distant; peduncles once or twice bifid below or at the middle. May. *l.* elliptic or elliptic-oblong, chartaceous, 2in. to 3in. long, blunt, shining-glabrous. 1818. A small tree.

S. tomentosum (tomentose). *fl.* distant; peduncles rather exceeding the leaves, once or twice bifid about the middle. May. *l.* elliptic, 3in. to 4in. long, glabrous above, velvety-tomentose beneath. 1822. A small tree.

STENOTAPHRUM (from *stenos*, narrow, and *taphros*, a trench; referring to the cavities in the rachis in which the spikelets are seated). SYN. *Diastemanthe*. ORD. *Gramineæ*. A small genus (two or three species) of stove, creeping, radicant grasses, inhabiting tropical regions, mostly near the sea. Spikelets usually two or four together in very short spikes, embedded in the alternate notches of the broad rachis of a spike-like panicle, the rachis of the partial spike usually produced into a short point beyond the insertion of the spikelets, and the common rachis often disarticulating transversely between the notches when old; glumes four; inflorescence terminal. Leaves flat or convolute, spreading. *S. americanum*, the only species in cultivation, is a curious, perennial grass, thriving in a light, loamy soil. It may be increased by seeds, or by divisions.

S. americanum (American). Australian Buffalo Grass. *fl.*, spikes solitary and terminal, 2in. or more long, the rachis flat and flexuous, readily disarticulating transversely between the notches when old. *l.* obtuse, flat or involute, the sheaths usually broad and flat, ciliated at the orifice. Stems somewhat flattened. *h.* about 1ft. Tropical regions, &c. SYN. *S. glabrum*.

S. a. variegatum (variegated).* *l.* 2in. to 4in. long, blunt, freely striped with creamy-white. 1874. An excellent basket plant. This is probably the plant catalogued by some nurserymen as *Stephanophorum glabrum variegatum*.

S. glabrum (glabrous). A synonym of *S. americanum*.

STEPHANANDRA (from *stephanos*, a crown, and *aner*, *andros*, a male; alluding to the disposition of the stamens). ORD. *Rosaceæ*. A monotypic genus. The species is a hardy, deciduous shrub, allied to **Spiræa** (which *see* for culture).

S. flexuosa (flexuous). *fl.* white, small, disposed in corymbose panicles or racemes, slenderly pedicellate, ebracteolate; calyx lobes and petals five, the latter spathulate. July. *l.* alternate, petiolate, incised, or pinnatifid and incised-serrate, pubescent beneath; stipules leafy, persistent. Branches slender, distichous, flexuous. Japan, 1870.

STEPHANIA (named in honour of Professor Frederick Stephan, of Moscow, who died in 1817). SYN. *Clypea*. ORD. *Menispermaceæ*. A small genus (three species) of stove or greenhouse climbers, natives of tropical Africa or Asia, or tropical and sub-tropical Australia. Flowers diœcious, disposed in simple or compound umbels; males with six to ten, females with three to five, sepals. Leaves usually peltate. The species introduced require similar treatment to **Morisonia** (which *see*).

Stephania—*continued.*

S. hernandifolia (Hernandia-leaved). *fl.* in capitate umbels, on short or long, axillary peduncles; petals three or four; rays eight to twelve, with subulate bracts. June. *l.* ovate or sub-deltoid, acute, obtuse, or acuminate at apex, truncate or sub-cordate at base, 3in. to 6in. in diameter, glabrous or thinly pubescent below or on both surfaces; petioles 1½in. to 4in. long. India.

S. rotunda (round-leaved). *fl.* orange; umbels loosely cymose. June. *l.* broadly ovate or nearly round, irregularly sinuate-lobed or repand, glabrous, on long petioles. Himalayas, 1866. Greenhouse.

STEPHANIA (of Willdenow). A synonym of **Steriphoma** (which *see*).

STEPHANIUM. A synonym of **Palicourea** (which *see*).

STEPHANOCOMA (from *stephanos*, a crown, and *kome*, hair; referring to the crown-like pappus). ORD. *Compositæ*. A monotypic genus. The species is a greenhouse, Thistle-like herb, requiring culture similar to **Berkheya** (which *see*).

S. carduoides (Thistle-like). *fl.-heads* yellow, discoid, small, at the tips of the branches, corymbose; involucral scales shorter than the disk, in many rows, subulate, margined with solitary, slender spines. Autumn. *l.* sparsely setulose, or glabrous on both sides, spiny-toothed or lobed, long-decurrent. Stem erect, striate, sub-glabrous. *h.* 2½ft. South Africa, 1864. (B. M. 5715, under name of *Stobæa sphærocephala*.)

STEPHANOLIRION. A synonym of **Tristagma** (which *see*).

STEPHANOMERIA (from *stephanos*, a crown, and *meris*, a part; a name of no particular application). SYN. *Jamesia* (of Nees). ORD. *Compositæ*. A genus comprising about eight species of hardy, glabrous, annual or perennial herbs, natives of North-west America. Flower-heads pink and white, radiate, sometimes terminal and erect, sometimes fascicled at the sides of the branches; ray florets ligulate, truncately five-toothed at apex. Leaves alternate, narrow, entire, remotely toothed, runcinate-pinnatifid, or the cauline ones reduced to short scales. Stems erect, simple or divaricately branched. Probably none of the species are now grown in this country.

STEPHANOPHORUM GLABRUM VARIEGATUM. *See* **Stenotaphrum americanum variegatum.**

STEPHANOPHYSUM. Included under **Ruellia** (which *see*).

STEPHANOTIS (from *stephanos*, a crown, and *ous*, *otos*, an ear; alluding to the auricles of the staminal crown). SYN. *Jasminanthes*. ORD. *Asclepiadeæ*. A genus comprising about fourteen species of glabrous, twining, often tall-climbing, stove shrubs; five are found in Madagascar, five in the Malayan Archipelago and South China, three in Cuba, and one in Peru. Flowers white, large, simple, in umbelliform cymes; calyx five-parted, the segments somewhat leafy; corolla salver-shaped or nearly funnel-shaped, the tube cylindrical, broader at the base, and dilated at the throat, the limb of five twisted lobes; coronal scales five, erect, often free at apex. Leaves opposite, coriaceous. Only two of the species have been introduced. *S. floribunda* is a beautiful and very popular, stove plant, because of its fragrant, pure white blossoms, which are produced in great profusion. It succeeds best in turfy loam, and may be increased by cuttings of the

Stephanotis—*continued.*

previous year's growth, inserted singly in pots, in spring, and placed in a close frame with a temperature of 60deg. Established plants do best when placed in a bed of prepared soil, about 3ft. square, and the growths trained to a trellis beneath the roof. *S. Thouarsii* thrives under similar treatment.

S. floribunda (bundle-flowered).* Clustered Wax Flower; Madagascar Chaplet Flower; Madagascar Jasmine. *fl.* of the purest white, highly fragrant, borne freely in large bunches; sepals ovate, obtuse, one-fourth as long as the corolla tube; segments of the corolla ovate-oblong; coronal scales ovate, shorter than the anthers; peduncles short, scarcely equalling the petioles. May. *l.* oval or ovate-elliptic, ample, of great substance, retuse or very shortly uncinate-acuminate. *h.* 10ft. Madagascar, 1839. See Fig. 531. (B. v. 203; B. M. 4058; G. C. n. s., xiv. p. 169; P. M. B. xi. 29.) The Elvaston variety is a compact-growing, floriferous form (G. C. n. s., xiv., p. 169.)

FIG. 531. FRUITING BRANCH, AND PORTION OF INFLORESCENCE, OF STEPHANOTIS FLORIBUNDA.

S. Thouarsii (Thouars'). *fl.*, sepals ovate-lanceolate, one-third the length of the corolla tube; coronal scales lanceolate, exceeding the anthers; peduncles equalling the petioles, three-flowered. May. *l.* obovate or obovate-oblong, shortly acuminate. *h.* 10ft. Madagascar, 1842.

STEPS. In gardens, these are best constructed of stone, which should be of a description suitable for withstanding frost and exposure to all weathers. Steps are necessary for affording a means of entering glass houses, when the latter are situated above the ground level, and for passing from one terrace walk to another, when the ground is too steep or inconveniently situated for forming a slope instead.

Folding Steps, made of wood, and hinged at the top,

Steps—*continued.*

are very valuable for standing upon in places where a ladder cannot be used. Two pairs of folding Steps, with a plank resting on their tops, make a good movable stage for the use of workmen engaged in clipping high hedges, &c.

STERCULIA (from Sterculius, a god, derived from *stercus*, dung; the flowers and leaves of some of the species are fœtid). Including *Brachychiton* (kept distinct in this work), *Delabechea*, *Ivira*, and *Southwellia*. ORD. *Sterculiaceæ*. Of this genus, about sixty species have been described as such, but probably not more than fifty are really distinct; they are stove or greenhouse, evergreen trees, inhabiting the warmer regions of the globe, being most plentiful in tropical Asia. Flowers paniculate or rarely racemose, the inflorescence usually axillary; calyx five-cleft or five-parted, rarely four-parted, often coloured; petals wanting; staminal column bearing at the summit fifteen (or rarely ten) stamens. Leaves undivided, lobed, or digitate. The species introduced, a selection of which is given below, succeed in a light, loamy soil, or a compost of loam and peat. Ripened cuttings, with the leaves intact, will readily root in sand, under a hand-glass; those of the stove species require a moist heat.

S. Balanghas (Balanghas). *fl.* purplish, panicled; calyx segments linear, five-cleft to the middle, the segments connivent. June to September. *l.* elliptic-oblong, rather blunt, entire, nearly smooth. *h.* 30ft. Malabar and East Indies, 1787. Stove.

S. Bidwilli (Bidwill's). The correct name of plant described in this work as *Brachychiton Bidwilli*.

S. discolor (discoloured).* *fl.* in terminal, contracted, spicate panicles; calyx rose-red, rusty-tomentose, $1\frac{1}{2}$in. long, between campanulate and funnel-shaped. *l.* long-petiolate, 5in. to 7in. long and broad, pale green, cordate or bilobed at base, with a broad or narrow sinus, more or less deeply five-lobed, but never beyond the middle. *h.* 40ft. West Australia, 1882. Greenhouse. (B. M. 6608.)

S. diversifolia (variable-leaved). Bottle-tree of Victoria. The correct name of plant described in this work as *Brachychiton diversifolium*.

S. Ivira (Ivira). *fl.* yellowish, with spreading segments, in panicles; carpels bristly. July. *l.* ovate, smooth, acuminated at the apex, entire, rarely three-lobed. *h.* 20ft. to 60ft. South America, 1793. Stove.

S. lanceolata (lanceolate-leaved). *fl.* reddish-brown, stellate, in small, axillary panicles; calyx segments spreading, not cohering at base; racemes simple. Summer. *l.* quite entire, smooth, ovate-lanceolate. *h.* 20ft. China. Greenhouse. (B. R. 1256.)

S. macrophylla (large-leaved). *fl.* yellow; calyx five-cleft, with spreading segments; panicles lateral, drooping. July. *l.* deeply cordate, obtuse, undivided, tomentose beneath. East Indies, 1822. A large, stove tree.

S. platanifolia (Plane-leaved). Chinese Parasol. *fl.* panicled. *l.* large, highly glabrous, cordate, three to five-lobed; lobes terminating in an acute point, the sinuses rounded; petioles terete. China. A tall, greenhouse tree.

FIG. 532. FRUITS AND LEAF OF STERCULIA RUPESTRIS.

S. pubescens (downy). A synonym of *S. tragacanthæ*.

FIG. 533. DEHISCING FRUIT AND SEED OF STERCULIA RUPESTRIS.

S. rupestris (rock-loving). Bottle-tree. *fl.*, calyx campanulate, deeply lobed; panicle tomentose, usually longer than the petioles. Summer. *l.* glabrous, either quite entire, oblong-linear or lanceolate, 3in. to 6in. long, or digitate, of five to nine sessile leaflets, often above 6in. long. Australia, 1880. A good-sized, greenhouse tree, the trunk often swelling to a large size—hence the common name. See Figs. 532 and 533. SYN. *Delabechea rupestris*.

S. tragacanthæ (tragacanth). Tragacanth Gum-tree of Sierra Leone. *fl.* red-brown; calyx segments equalling the turbinate tube; panicle axillary, coarctate, tomentose. Summer. *l.* ovate, acute, obtuse at base, tomentose beneath. *h.* 20ft. Guinea, 1793. Stove. (B. R. 1363.) SYN. *S. pubescens*.

S. villosa (villous). *fl.*, calyx downy outside, pinkish within; style recurved; panicle compound, pendulous. June. *l.* five to seven-lobed, acuminate, velvety-tomentose beneath. *h.* 15ft. East Indies, 1805. Stove.

STERCULIACEÆ. A natural order of usually soft-wooded herbs, shrubs, or trees, mostly inhabiting tropical and sub-tropical regions. Flowers regular, hermaphrodite or unisexual; calyx gamosepalous, usually persistent, more or less deeply five-cleft, rarely four or three-cleft, the lobes valvate; petals five, hypogynous, free or adnate at base with the staminal tube, often marcescent-persistent, twisted-imbricated, or wanting; stamens very variable; inflorescence axillary or rarely terminal, racemose or cymose-paniculate, or rarely reduced to a solitary flower. Fruit dry or rarely baccate. Leaves alternate, or very rarely nearly opposite, sometimes simple, penninerved or palminerved, entire, toothed, or lobed, sometimes digitately three to nine-foliolate; stipules at the bases of the petioles, very rarely wanting. *Sterculiaceæ* contain an abundant mucilage, combined, in the old bark of the woody species, with a bitter, astringent matter, and are emetics and stimulants. The dried and split cotyledons of the seeds of *Theobroma Cacao* are called cocoa nibs, and, when ground and made into a paste, chocolate. The seeds comprise, among other properties, a fixed and solid oil, known as cocoa butter. The order embraces about forty-six genera, and 520 species. These are classified, by the authors of the "Genera Plantarum," under seven tribes: *Buettnerieæ*, *Dombeyeæ*, *Eriolæneæ*, *Helictereæ*, *Hermannieæ*, *Lasiopetaleæ*, and *Sterculieæ*. Illustrative genera are: *Buettneria*, *Cola*, *Commersonia*, *Helicteres*, *Lasiopetalum*, *Sterculia*.

STEREOSANDRA (from *stereos*, rigid, and *aner*, *andros*, a male or anther; in reference to the upright stamen). ORD. *Orchideæ*. A monotypic genus. The species is a stove, terrestrial, leafless orchid, bearing a loose raceme of shortly-pedicellate, medium-sized flowers. It is a native of Java, and has not been introduced to cultivation in this country.

STEREOXYLON. A synonym of *Escallonia*.

STERIGMA (from *sterigma*, a fork; the larger stamens are connected at the base and forked at the top). SYN. *Sterigmostemon.* ORD. *Cruciferæ.* A genus comprising five species of hardy, robust, perennial herbs, natives of Asia Minor, Persia, the Caspian region, and Siberia. Flowers yellow, rather large, in elongated, ebracteate racemes; sepals sub-erect; pedicels rather thick, spreading. Leaves entire or pinnatifid. One or two of the species have been introduced, but they are now probably lost to cultivation.

STERIGMA. A term applied to any foliaceous prolongation of the blade of a leaf down on the stem by decurrence.

STERIGMOSTEMON. A synonym of **Sterigma** (which *see*).

STERILE. Barren. A male or staminate flower is commonly said to be Sterile.

STERIPHOMA (from *steriphoma*, a foundation; in allusion to the large fruit-stalk). SYNS. *Rœmeria* (of Trattinick), *Stephania* (of Willdenow). ORD. *Capparideæ.* A small genus (three species) of stove, unarmed shrubs, natives of Peru, New Grenada, Venezuela, and the Trinity Islands. Flowers orange, showy; calyx two or four-lobed at apex, irregularly ruptured; torus very short; petals four, sessile; stamens six; racemes terminal; peduncles thick; pedicels thickened at the apex, infracted or recurved, one-flowered. Leaves long-petiolate, one-foliolate; leaflet lanceolate, entire; petiole thickened at the apex. The only species introduced is well worth cultivating on account of the beauty of its flowers. It thrives in a compost of equal parts loam, peat, and sand. Cuttings should be taken from young wood, inserted in a pot of sand, and plunged in heat, under a hand glass.

S. cleomoides (Cleome-like).* *fl.* with a reddish-brown calyx and yellow petals and stamens. April to July. *l.* oblong-lanceolate, much acuminated, scarcely longer than the footstalks. *h.* 6ft. Caraccas, 1823. SYN. *S. paradoxum* (B. M. 5788; F. d. S. 564-5; L. & P. F. G. i. 73, p. 107.)

S. paradoxum (paradoxical). A synonym of *S. cleomoides.*

STERIS. Now included under **Hydrolea** (which *see*).

STERNBERGIA (named in honour of Count Caspar Sternberg, 1761-1838, a celebrated botanist). Mount Etna Lily. Including *Oporanthus.* ORD. *Amaryllideæ.* Of this genus, about twelve species have been described, but, according to Mr. Baker, not more than four are distinct as such; they are hardy, bulbous plants, inhabiting Eastern Europe and the Mediterranean region. Flower often solitary; perianth funnel-shaped, straight, with a short or rather long tube, and linear or lanceolate, equal, erecto-patent lobes; stamens equally affixed at the throat or the bases of the lobes; bracts membranous, hyaline, tubular at base; scape short, sometimes very short, solid. Leaves late or cotemporary with the flowers. Bulb tunicated. *S. lutea* is a popular and valuable plant, on account of its yellow flowers being produced in autumn. The genus may be divided into two sections, viz., *Sternbergia* proper, having autumnal flowers, with a cylindrical tube, and leaves produced in spring; and *Oporanthus*, with short-tubed, funnel-shaped flowers, produced, with the leaves, in October. To the first section belong *S. colchiciflora*, *S. macrantha*, and *S. Schubertii.* *S. lutea* and its forms comprise the second section. Only a couple of species call for mention here. They succeed best in soil of a good depth, and in a sheltered position. The bulbs may be placed from 4in. to 6in. below the surface when planting.

S. colchiciflora (Colchicum-flowered). *fl.* sessile, erect, odorous; perianth tube yellowish-white, straight, partly subterraneous, five to nine lines long; limb yellow, erecto-patent, 1in. to 1½in. long, the segments striate-nerved; scape subterraneous, one-flowered. Autumn. *l.* produced in spring, rarely in autumn, usually five, erect, twisted, carinate, obtusely callous, 4in. long, one line or more broad. Hungary and Roumelia, 1816. (B. R. 2008.)

S. lutea (yellow).* Winter Daffodil; Yellow Star Flower. *fl.*, perianth yellow, 1¾in. to 2¼in. long, turbinate-campanulate; tube straight, funnel-shaped; segments slightly concave, obtuse or emarginate, twelve to seventeen lines long; scape 2in. to 4in. long. Autumn. *l.* five, six, or more, arcuate-reflexed, linear-lorate, obtusely carinate, canaliculate, obtuse, dark green, 6in. to 12in. long, four to six lines broad. Central Europe, 1596. See

FIG. 534. STERNBERGIA LUTEA.

Fig. 534. SYN. *Amaryllis lutea* (B. M. 290; S. F. G. 310). This plant is supposed to be the "Lily of the Field," of Scripture. The following, often classified as species, are regarded, by Mr. Baker as mere varieties:

S. l. exigua (mean). *fl.* erect; perianth tube campanulate, with equal segments; scape 1in. long. *l.* one to three, short. North Africa, 1820.

S. l. Fischeriana (Fischer's). *fl.* pale yellow; perianth scarcely 1½in. long; scape 9in. long, mostly underground. Spring. *l.* erect, loriform, quite flat. Karabagh, 1868. (R. G. 576, under name of *S. Fischeriana.*)

S. l. græca (Grecian). A form with short peduncle, leaves short at flowering period, finally 4in. to 5in. long by 1/12in. broad. Greece.

S. l. sicula (Sicilian).* A variety bearing larger flowers, with more acute, narrower perianth segments. Sicily.

STEUDELIA (of Sprengel). A synonym of *Erythroxylon.*

STEUDNERA (named after Dr. Steudner, of Gorlitz, a German botanist). ORD. *Aroideæ* (*Araceæ*). A small genus (three or four species) of stove, herbaceous perennials, natives of Burmah. Flowers all perfect, dense, the females much shorter than the males; spathe opening,

Steudnera—*continued.*

very shortly convolute at base, ovate-lanceolate, at length reflexed above the middle, marcescent; spadix much shorter than the spathe, part of the back female flowers adnate; peduncle short. Leaves long-petiolate, peltate, ovate-oblong, emarginate at base. Caudex thick, elongated, ascending, membranous-sheathed. *S. colocasiæfolia* and its variety are the only members of this genus yet introduced. These thrive in a soil composed of rich, sandy loam, leaf mould, and bits of broken charcoal, well mixed and drained. A moist atmosphere is desirable, and a resting period necessary. Propagation may be effected by suckers, by cuttings, or by division of the rootstock.

S. colocasiæfolia (Colocasia-leaved). *fl.*, spathe yellowish, more or less dark purple within, becoming recurved so as to expose the spadix, which is whitish, one-third as long as the spathe, and erect. *l.* of an obscure green above, paler beneath; petioles sometimes of a somewhat violet colour. Stems short, thick, fleshy. 1869. (I. H. n. s. 90; R. G. 633.)

S. c. discolor (two-coloured). *fl.*, spathe yellow on both surfaces, the base reddish-purple. *l.* marked between the primary veins above with a series of broad, brownish-purple blotches. *h.* 1ft. 1874. (B. M. 6076 and F. d. S. 2201, under name of *S. colocasiæfolia.*)

STEVENIA. Included under *Arabis.*

STEVENSONIA (named after Stevenson, formerly Governor of the Island of Mauritius and its dependencies). SYN. *Phœnicophorium.* ORD. *Palmæ.* A monotypic genus. The species is a noble, stove Palm. It thrives in a hot, moisture-laden atmosphere, and suffers if the temperature falls too low, or the air becomes dry. The mixture best adapted for it is a well-drained, fibrous peat, with pieces of charcoal and turfy loam and sand intermixed. Propagated by means of imported seeds.

S. grandifolia (large-leaved).* *fl.*, lower spathes 1½ft. long, the upper ones club-shaped, smooth, 2ft. to 3½ft. long; spadix 3ft. to 6ft. long; peduncle 1½ft. to 3ft. long, compressed at base. *fr.* orange-red, ½in. to ⅝in. long. *l.* cuneate-obovate, bifid, oblique at base, deeply laciniated down the side, with incised segments; petioles 9in. to 18in. long, glabrous, pale green, convex below; sheaths 2ft. to 3ft. long, hoary, scaly, and spiny. Stem very spiny when young, less so when old. *h.* 40ft. Seychelles, 1865. SYNS. *Areca sechellarum, Astrocaryum Borsignyanum* and *A. pictum* (all of gardens), *Phœnicophorium sechellarum* (I. H. 433).

STEVIA (named after Peter James Esteve, M.D., Professor of Botany at Valencia, in the sixteenth century). ORD. *Compositæ.* A genus of stove, greenhouse, or hardy herbs or sub-shrubs, rarely diffuse. More than 100 species have been described by various authors, but the number may be reduced; they inhabit the warmer parts of America. Flower-heads white or purplish, paniculate or corymbose; involucre cylindrical; bracts five or six; receptacle flat, naked; florets five, equal, regular, five-cleft, tubular; achenes narrow; pappus paleæ or bristles two or many. Leaves opposite, or the upper ones alternate, often triple-nerved and serrated, sometimes trisected or entire. The under-mentioned species are rather pretty, perennial herbs, and, except where otherwise stated, all succeed in the open flower-border, in summer. The protection of a frame is necessary in severe weather. Propagation may be effected by seeds, by cuttings, or by divisions.

S. breviaristata (short-awned). *fl.-heads* of a beautiful rose-colour, disposed in a dense corymb; florets with a long tube and a limb of five spreading segments; pappus of three rather strong, rigid crowns, short. July. *l.* opposite, nearly glabrous, coarsely serrated, attenuated, but not petiolate; upper ones lanceolate. Branches downy. *h.* 2ft. to 3ft. Tucuman, 1836. Stove. (B. M. 3792.)

S. Eupatoria (Hemp Agrimony-like). *fl.-heads* in fastigiate, rather loose corymbs; florets white, flesh-coloured in the tube, twice as long as the involucre. August. *l.* lanceolate, somewhat attenuated into the petioles, three-nerved, the upper ones obsoletely serrated. *h.* 1½ft. Mexico, 1826. (B. M. 1849.) SYN. *S. punctata.*

S. fascicularis (fascicled). A synonym of *S. rhombifolia.*

S. hyssopifolia (Hyssop-leaved). A synonym of *S. paniculata.*

S. ivæfolia (Iva-leaved). A synonym of *S. serrata.*

S. ovata (ovate-leaved). *fl.-heads* white, in rather compact, fastigiate corymbs. August. *l.* ovate, serrated, cuneate at base,

Stevia—*continued.*

entire; upper ones oblong, sub-entire. Stem erect, paniculate. *h.* 2ft. Mexico, 1816.

S. paniculata (paniculate). *fl.-heads* white, the tubes of the ray florets, which are longer than the involucre, purplish; peduncles slightly branched, three or four-headed, corymbose. August. *l.*, lowest ones opposite, ovate; upper ones alternate, ovate-oblong, serrated, cuneate at base, entire, the uppermost ones linear-lanceolate. Stem erect, shortly pubescent, paniculate. *h.* 1½ft. Mexico, 1824. (B. M. 1861, under name of *S. hyssopifolia.*)

S. pedata (pedate-leaved). *fl.-heads* loosely corymbose; involucre purplish; florets white, all tubular; anthers dark purple. July to September. *l.* alternate, pedate, generally seven-cleft; leaflets linear, quite entire, with revolute margins; petioles channelled, trifid. Stem erect, branched towards the top. *h.* 1ft. Mexico, 1803. (B. M. 2040.) The correct name of this plant is *Florestina pedata.*

S. pubescens (downy). *fl.-heads* purple; involucre pubescent; pappus paleaceous; corymbs fastigiate, rather dense. August. *l.*, lower ones opposite, sub-spathulate, toothed at apex, attenuated into the petioles; upper ones scattered, linear, sub-entire. Stem simple, somewhat erect, pubescent. *h.* 1½ft. Mexico, 1823.

S. punctata (dotted). A synonym of *S. Eupatoria.*

S. purpurea (purple). *fl.-heads* purple, in slightly coarctate corymbs; involucre pale greenish; pappus paleaceous and three-awned. August. *l.* lanceolate, alternate; lower ones obovate, channelled, narrowed into the petioles, serrulated at apex. Stem erect, velvety-pubescent, much-branched. *h.* 1½ft. Mexico, 1812. (B. R. 93, under name of *S. Eupatoria.*)

S. rhombifolia (rhomb-leaved). *fl.-heads* white or yellow and white, rarely red, in fascicles at the tips of the branches. September. *l.*, lower ones rhomboid-ovate, crenate-serrated; upper ones often alternate, narrower, and more entire. *h.* 1½ft. Mexico, 1827. (B. R. xxiv. 59, under name of *S. fascicularis.*)

S. serrata (saw-edged). *fl.-heads* white or pink, in fastigiate corymbs; pappus bristly, two or often three-awned. August. *l.* alternate, somewhat fascicled, linear-lanceolate, slightly glabrous, serrated, entire at base and attenuated into the petioles. Stem erect, branched, pubescent. *h.* 1½ft. Mexico, 1827. SYN. *S. ivæfolia.*

S. trachelioides (Throatwort-like). *fl.-heads* purple; involucral scales downy, mucronate-acuminate; pappus crown-like, very short; corymbs clustered, many-headed. August. *l.* of the lower branches opposite, cuneate at base or entire, sessile; the rest broadly ovate, slightly acute, deeply crenate-serrate, hairy on both sides. Stem erect, densely velvety-pubescent. *h.* 2½ft. Mexico, 1839. Greenhouse. (B. M. 3856.)

STEWARTIA. *See* **Stuartia.**

STIBASIA. Included under *Marattia.*

STICHUS. A term which, used in Greek compounds, denotes a rank or row: *e.g.*, Distichous, two-ranked.

STICKMANNIA. A synonym of **Dichorisandra** (which *see*).

STIFFTIA (so called after A. J. Stifft, 1760-1836, Imperial Physician in Austria). SYNS. *Aristomenia, Augusta, Sanhilaria.* ORD. *Compositæ.* A genus comprising four or five species of stove, glabrous trees and shrubs, natives of Brazil or Guiana. Flower-heads yellow or orange, large and solitary or few together, or smaller and paniculate; involucral bracts in many series, imbricated, obtuse, appressed, the outer ones gradually shortening; receptacle naked, foveolate; florets tubular, with a limb of five, narrow, revolute lobes; achenes elongated; pappus bristles in many series. Leaves alternate, coriaceous, entire. *S. chrysantha* is a fine, showy, evergreen shrub, requiring a well-drained, turfy loam, and a light, airy situation. It is propagated by cuttings of the young wood, inserted in sandy soil, under a bell glass, in bottom-heat.

S. chrysantha (golden-flowered). *fl.-heads* orange-colour, 2in. in diameter, solitary; florets indefinite; pappus saffron-colour. February to April. *l.* lanceolate, acuminate. *h.* 6ft. Brazil, 1840. (B. M. 4438.)

STIGMA (from *stigma*, a mark; in allusion to the Stigma being a mark or spot on the style). That part of the pistil of a flower which is fitted to receive the pollen when mature, and to permit the passage of pollen tubes for the fertilisation of the ovules. It is peculiar

Stigma—*continued.*

in having its surface covered with long cells, attached loosely by one end to the cells below, with the other end free. These cells secrete a sticky fluid, which retains the pollen grains when they touch it, and also stimulates them to emit tubes (*see* **Pollen**). The tubes can readily pass in between the loosely-arranged cells of the Stigma, and then down the loose "conducting tissue" of the style and ovary. The Stigma has no epidermis upon it, in which it differs from all other parts of flowering plants. It is usually situated on the tip or along one side of the style; or the latter may be absent, in which case the Stigma is situated on the tip of the ovary. It may be displaced from this position by inequality of growth in the two sides of the ovary. Each carpel has a Stigma; but where two or more carpels are closely united, the Stigmata may also be so united as to appear like one. In those flowers that are pollinated by wind (*e.g.*, Grasses), the Stigma is frequently covered with long, spreading hairs; while in those pollinated by insects, and in cleistogamous flowers, the Stigma is usually small, and confined to the tip of the style, or to a narrow line on one side of it.

STIGMAPHYLLON (from *stigma*, and *phyllon*, a leaf; alluding to the stigmas being expanded into a sort of leaf). ORD. *Malpighiaceæ.* A genus comprising about fifty species of handsome, stove, climbing shrubs, natives of tropical America. Flowers yellow; calyx five-parted, eight-glanded; petals unguiculate, unequal, glabrous; stamens ten, unequal, six being perfect; corymbs umbelliform, on axillary and terminal branchlets or peduncles; pedicels minutely bracteate at base, articulated and bibracteolate below the middle. Leaves generally opposite, of two forms, entire or denticulate, rarely lobed; petioles biglandular; stipules minute. The species best known to cultivation are described below. They will grow in a mixture of loam, leaf soil, and peat, with the addition of some sharp sand. Cuttings, made from ripened wood, will root freely if inserted in sandy soil, under a hand glass, in heat, taking about three or four weeks to do so.

S. aristatum (awned). *fl.*, petals fimbriated; umbels pedunculate, few-flowered. June to August. *l.*, cauline ones glabrous, sagittate-hastate, angled, acute; those on the younger branchlets often oblong, entire; petioles biglandular at apex. *h.* 15ft. Brazil, 1832. (B. R. 1659.)

S. ciliatum (ciliated).* Golden Vine. *fl.* large, three to six in an umbel; petals fringed, with long claws. October. *l.* opposite, cordate, oblique at the base, smooth, ciliated, glaucous. Brazil, 1796. A tall climber. (P. M. B. xv. 77.)

S. diversifolium (variable-leaved). *fl.*, pedicels articulated at the base. June. *l.* shining above, pubescent or tomentose beneath, ovate or oblong-linear, rounded or almost cordate at base; petiolar glands close to the leaf. West Indies, 1826. Lofty climber.

S. fulgens (brilliant). *fl.* borne on divided peduncles. Summer. *l.* glabrous above, silvery beneath with silky down, cordate-rounded, mucronulate, repand, entire; basilar sinus open; petioles biglandular a little below the top. West Indies, &c., 1759. Tall climber.

S. heterophyllum (variable-leaved). *fl.* several to an umbel, on solitary, axillary peduncles; sepals erect; petals orbicular. December. *l.* opposite, mostly ovate, waved, entire, very obtuse, mucronate; sometimes broader, almost cordate, deeply three-lobed; lobes oblong, obtuse, mucronate, the side ones spreading. Buenos Ayres, 1842. Tall climber. (B. M. 4014.)

S. jatrophæfolium (Jatropha-leaved). *fl.*, petals fimbriated, shell-shaped; umbel many-flowered. Summer. *l.* palmately five to seven-cleft or parted, acute, serrate-ciliated, cordate, clear light green; petioles biglandular at apex. *h.* 6ft. Uruguay, 1841. (B. R. xxx. 7.)

S. littorale (shore-loving).* *fl.* on pedicels ½in. to 1½in. long; corolla 1in. in diameter; claw of the petals longer than the sepals; peduncles axillary, solitary, many-flowered; corymbs terminal, simple or compound. Autumn. *l.* opposite and alternate, long-petiolate, 2in. to 5in. long, varying in shape. South Brazil, 1882. A tall, leafy climber. (B. M. 6623.)

STIGMAROTA. A synonym of **Flacourtia** (which *see*).

STIGMATIC, STIGMATOSE. Relating to the stigma.

STIGMATIFEROUS. Stigma-bearing.

STIGMATOID. Stigma-like.

STILAGINEÆ. Included under *Euphorbiaceæ.*

STILBEÆ. A tribe of *Verbenaceæ.*

STILLINGFLEETIA. A synonym of **Sapium** (which *see*).

STILLINGIA (named in honour of Dr. Benjamin Stillingfleet, 1702-1771, an eminent English botanist). ORD. *Euphorbiaceæ.* Thirteen species have been referred to this genus; they are stove or greenhouse, glabrous shrubs, inhabiting North and South America, the Mascarene and Pacific Islands. Flowers monœcious, apetalous; males often three under a bract, sub-sessile; females solitary under the lower bracts, sessile or very shortly pedicellate, few in a spike, or the spike sometimes all males; spikes terminal, simple; bracts short and broad, biglandular. Leaves alternate or rarely opposite, shortly petiolate, entire or glandular-denticulate. *S. sebifera*, the Tallow-tree of China, the proper name of which is *Excœcaria sebifera*, is the only species calling for mention here; it yields a hard wood, used by the Chinese for wood engravings; tallow is extensively obtained from the seeds, and the leaves are employed for dyeing black.

STINGING BUSH. A common name for *Jatropha urens.*

STINKING GLADWYN. A common name for *Iris fœtidissima.*

STIPA (from *stipe*, a silky or feathery substance; alluding to the inflorescence). Including *Lasiagrostis* and *Macrochloa.* ORD. *Gramineæ.* A large genus (nearly 100 species) of stove, greenhouse, or hardy, tall or rarely dwarf, perennial grasses, widely distributed over tropical and temperate regions. Spikelets one-flowered, narrow, paniculate, the rachis of the spikelet articulated above the lower glumes; glumes three, narrow, keeled, the two outer ones usually persistent; panicle terminal, often slender, slightly branched. Leaves convolute-terete or rarely flat. A selection from the few introduced hardy species is given below. With the exception of *S. elegantissima*, all are hardy. *S. pennata*, the well-known Feather Grass of gardens, is a very ornamental plant. Stipas thrive in any ordinary soil, and may be increased by seeds or by divisions.

FIG. 535. STIPA PENNATA.

S. elegantissima (very elegant). *fl.*, panicle very loose, 6in. to 8in. long, at length broadly spreading; the rachis and long, filiform branches elegantly plumose with fine, spreading hairs. *l.* narrow, mostly erect, convolute when dry. Stems from a horizontal rhizome, erect and branching, 2ft. to 3ft. high. Australia. Greenhouse.

S. gigantea (gigantic). *fl.*, glumes subulate, much longer than the perianth; perianth ½in. long, naked above; bristles slightly

Stipa—*continued.*

twisted, flexuous, very slenderly pubescent, five times longer than the glumes. *h.* 3ft. Spain, 1823.

S. juncea (Rush-like). *fl.*, glumes subulate, one-third longer than the perianth, the lower ones slightly larger; perianth nearly five lines long, naked above; bristles twisted, plicate, pilose, six times longer than the glumes; anthers bearded. *h.* 3ft. South-west Europe, 1772.

S. Lasiagrostis (Lasiagrostis).* *fl.* shortly stipitate; spikelets one-flowered; glumes two, exceeding the flowers; panicle thickened, branched, diffuse. *l.* flat. Culm often branched. South Europe. Plant tall, erect, showy. SYN. *Lasiagrostis Calamagrostis.*

S. pennata (feathery).* Feather Grass. *fl.*, glumes more than double the length of the perianth, the lower ones rather larger; perianth more than ½in. long, naked above; bristles twisted, plicate, plumed above, eight times longer than the glumes; anthers naked. *h.* 2ft. Europe (said to have been found in Britain, but this is doubtful). This plant has been long grown in gardens: according to Gerarde, the ladies used to wear the beautifully feathered beards as feathers. See Fig. 535.

Stipa—*continued.*

S. tenacissima (very tenacious). Esparto Grass. *fl.* stipitate; paleæ membranous, the lower one bifid at apex; panicles spicate, branched, clustered or divaricate. *l.* convolute, filiform. South Europe. A tall grass. SYN. *Macrochloa tenacissima.*

STIPE (from *stipes*, a stalk). A term used in various senses, viz.: 1. The erect, cylindrical stem of a Palm or of a Tree-fern, bearing the persistent leafstalks, or the leaf-scars; in this sense it is equal in meaning to "caudex." 2. A prolongation of the floral axis between any two whorls of a flower, *e.g.*, between the calyx and corolla (as in *Silene*), when it is better called "Anthophore," or between the stamens and pistil (as in *Geum rivale*), forming a "Gynophore," or, when the fruit is ripe, a "Carpophore." 3. The stalk that supports the pileus or cap of **Mushrooms** (which *see*). 4. The leafstalk in Ferns.

FIG. 536. ERYTHRINA INDICA PARCELLI, showing Glandular Bodies in place of Stipels.

STIPELLATE. Furnished with stipels.

STIPELS. Small bodies, like diminutive stipules, situated at the base of each leaflet in certain compound-leaved plants (*e.g.*, *Phaseolus*), but solitary, except that there are two at the base of the terminal leaflet. Leaflets in such leaves are said to be "stipellate." In some plants, *e.g.*, *Erythrina* (see Fig. 536), Stipels are replaced by small, glandular bodies.

FIG. 537. GARDEN VARIETY OF PEA, showing Stipules resembling Leaflets in appearance and in use.

FIG. 538. FLOWERS, LEAF, AND LEAFLET-LIKE STIPULES OF LOTUS JACOBÆUS.

STIPITATE. Having a stipe, or stalk, which is neither a petiole nor a peduncle.

STIPITIFORM. Stalk-like; shaped like a stipe.

STIPULACEOUS, STIPULAR. Belonging to stipules.

STIPULATE. Possessing stipules.

STIPULES (from *stipula*, an upright leaf). Bodies, almost always two in number, and quite alike, situated one at each side of the base of each leaf, in many flowering plants, and in one or two Ferns. Stipules vary much in appearance and size; but the two sides of each are unlike one another. They often resemble leaflets, *e.g.*, in Pea (see Fig. 537), and in *Lotus* (see Fig. 538), and are free from everything but the stem. In these cases, they do the work of leaflets; and they may even wholly replace the leaves in their action on gases, the leaves serving other uses—*e.g.*, tendrils in *Lathyrus Aphaca* (a British weed). In many plants, *e.g.*, Rose (see Fig. 539), the Stipules are small, and are fixed along each side of the base of the leafstalk (this arrangement is called "adnate"); in others, they resemble bud-scales, and serve the same purpose as the latter organs, protecting the tender structures in buds, *e.g.*, Beech (see Fig. 540), Oak. In a few plants, Stipules of each pair are united, and form a single body, opposite the leaf (*Platanus*), or between it and the stem (*Potamogeton*), or form a sheath or "ochrea" around the stem (*Polygonum* and *Rumex*). In the genus *Galium*, they are so like the true leaves that the latter are distinguished only by having the buds in their axils; and the Stipules and leaves together resemble a whorl of true leaves. Frequently, Stipules are so small as to be readily overlooked; and in a good many plants they fall off early, and may thus not be

FIG. 539. ROSE-LEAF, showing Adnate Stipules.

FIG. 540. BRANCHLET OF FAGUS SYLVATICUS, showing Stipules resembling Bud Scales.

Stipules—*continued.*

detected. They are very constantly present in certain classes of plants; hence, their presence and their nature afford important characters in the definition of many natural orders. In many orders, they are not constantly met with, and in many others do not occur at all.

FIG. 541. FLOWER-HEAD AND LEAF OF MIMOSA PUDICA, showing Stipules metamorphosed into Spines.

Occasionally, *e.g.*, *Mimosa* (see Fig. 541), they are metamorphosed into spines.

STIRPS. A race, or permanent variety; *e.g.*, the Red Cabbage.

STITCHWORT, or **STITCH GRASS.** *See* **Stellaria.**

STIZOLOBIUM. A synonym of **Mucuna** (which *see*).

STOBÆA. Included under *Berkheya.*

STOCK. The portion of a stem to which a graft is applied; a caudex, rhizome, or root-like base of a stem, from which roots proceed; the term is also used to denote a race.

STOCK, CAPE. A common name for **Heliophila** (which *see*).

STOCKS (*Mathiola*). Stocks are well-known and very popular plants with every class of cultivators, because of their beauty for flowering in pots and in the open border, and of the sweet perfume which their flowers emit. There are several distinct classes or types, all of which have been greatly improved, in course of time, by florists and seedsmen in this country and on the Continent. The different types may readily be divided into Summer and Winter Stocks, the former embracing the whole of the Ten-weeks varieties, and the latter the Brompton, East Lothian, and Intermediate types.

The greater portion of the Ten-week Stock seed is imported annually from the Continent, in spring. It is well to divide the supply, and sow a part towards the end of March, and the rest during April; the least heat from fermenting material is of great help in assisting and hastening germination. So soon as the seedlings appear above ground, plenty of air must be given during favourable weather, and water should be carefully applied, as damping and mildew generally prove very destructive sources of evil. If either commence an attack, the best thing is to prick off all the uninjured plants, about 3in. apart, in new soil. Advantage should be taken to transfer Stocks from a frame into the open border during showery weather; it cannot be done very successfully at any other time, unless the plants have been

Stocks—*continued.*

prepared in small pots. The soil for Stocks can scarcely be too rich; it should, therefore, be well dug and manured; and a top-dressing of leaf mould or short manure is also of great benefit in affording nourishment, and preventing evaporation during dry weather. Summer Stocks are not generally grown in pots; they form good beds outside, when the plants succeed, and their flowers are excellent for cutting.

Of Winter Stocks, the most extensively cultivated are the Intermediate and the East Lothian Intermediate; the latter succeeds well in Scotland. The Brompton Stocks are very vigorous; they flower about May and June, and the seed should be sown nearly a year in advance, or not later than the early part of July. It is always safer to preserve a quantity of plants in cold frames during winter, than to place them outside; they usually suffer more from excessive moisture than from cold. Stocks intended for flowering in pots, should be inserted singly, in small thumbs, early in autumn, and plunged in ashes, in a cold frame. When sufficiently established, and in need of more space, they should be transferred into 5in. pots; this is generally done late in autumn, or early in the following spring, when the double and single-flowered plants can be distinguished from each other. The Intermediate and East Lothian varieties should be selected for cultivating in pots in preference to the Brompton; they have a branching yet compact habit, and flower profusely. The soil used for potting should be of a loamy description, with nearly one-fourth of sifted old mortar intermixed. When the plants are growing, plenty of water is requisite, and manure water is of great help when the flower-buds are developing. Stocks kept in frames through winter, for planting into outside borders, should be transferred to their permanent quarters during March, or as soon afterwards as the weather is considered favourable for their well-being.

Saving Seed for Producing Double Flowers. The following remarks are extracted from the appendix to Dr. M. T. Masters' classical work, "Vegetable Teratology," published by the Ray Society in 1869. The reader is also referred to a leading article in the "Gardeners' Chronicle," 1866, p. 74, and to a separate work by Mons. E. Chaté, "Traité des Giroflées." The last-named author observes that the gardeners of Erfurt "have, for a long time, to a certain extent, monopolised the sale of seeds of these plants. To obtain these seeds, the Erfurt gardeners cultivate the flowers in pots, and place them on shelves, in large greenhouses, giving them only sufficient water to prevent them from dying. So cultivated, the plants become weakened, the pods shortened, and the seeds less numerous, and better ripened; and these seeds give from sixty to seventy per cent. of double flowers. The seeds from these plants are said to be mostly of an abnormal shape, which is so striking that experienced cultivators are able to separate those which would furnish double flowers from those which would produce single ones."

M. Chaté's method, which he calls the French one, gives still greater results, viz.: eighty per cent. of double flowers, and these produced by very simple means. "When my seeds," he observes, "have been chosen with care, I plant them, in the month of April, in good dry mould, in a position exposed to the morning sun, this position being the most favourable. At the time of flowering, I nip off some of the flowering branches, and leave only ten or twelve pods on the secondary branches, taking care to remove all the small weak branches which shoot at this time. I leave none but the principal and secondary branches to bear the pods. All the sap is employed in nourishing the seeds thus borne, which give a result of eighty per cent. of double flowers. The pods, under this management, are thicker, and their maturation is more perfect. At the time of extracting the seeds, the upper portion of the pod is

Stocks—*continued.*

separated and placed aside, because it has been ascertained that the plants coming from the seeds situated in this portion of the pod give eighty per cent. of single flowers. They yield, however, greater variety than the others. This plan of suppressing that part of the pod which yields single flowers in the largest proportion, greatly facilitates the recognition of the single-flowered plants, because there remains to be eliminated from among the seedlings only from ten to fifteen per cent."

This separation of the single from the double-flowered plants, M. Chaté tells us, is not so difficult as might be supposed. The Single Stocks, he explains, have deep green leaves (glabrous in certain species), rounded at the top, the heart being in the form of a shuttlecock, and the plant stout and thickset in its general aspect; while the plants yielding double flowers have very long leaves of a light green colour, hairy, and curled at the edges, the heart consisting of whitish leaves, curved so that they completely inclose it.

Such is the substance of M. Chaté's method of securing so large a proportion of double-flowered plants, and then of separating them from the remaining single ones—a method which commends itself to the good sense of the intelligent cultivator.

Another plan for the separation of the single from the double-flowered plants, in vogue amongst a class of cultivators, is the degustation of the buds, that is to say, the chewing of the young buds: the single plants can be recognised by their crispness and greater consistence, and can thus be weeded out. The disadvantage attending this method is that the plants, single as well as double, must all be grown up to the period when these buds are tolerably well advanced.

STOCK, TEN-WEEKS. A common name for **Mathiola annua** (which *see*).

STOCK, VIRGINIAN. A common name for **Malcolmia maritima** (which *see*).

STŒCHAS. Included under *Lavandula*.

STOKES' ASTER. *See* **Stokesia cyanea.**

FIG. 542. STOKESIA CYANEA

STOKESIA (named in honour of Jonathan Stokes M.D., 1755-1831, the coadjutor of Withering in his

Stokesia—*continued.*

arrangement of British plants). SYN. *Cartesia*. ORD. *Compositæ*. A monotypic genus. The species is a handsome, sparingly-branched, greenhouse, erect, perennial herb. It thrives in the open border during the summer months. Propagation may be effected by seeds, or by division of the roots.

S. cyanea (blue).* Stokes' Aster. *fl.-heads* blue, 1in. across, few or solitary, terminal, pedunculate; involucre sub-globose, the outer scales prolonged into a leafy, bristly-fringed appendage, the inner ones lanceolate and entire; florets narrowly five-cleft; pappus composed of four or five chaffy scales. August. *l.* alternate, smooth, lanceolate, entire or spinuloso-ciliate at base; lower ones petiolate; upper ones amplexicaul. Stem 1ft. to 1½ft. high. North America, 1766. See Fig. 542. (B. M. 4966.)

STOLE, or STOLON. A branch arising from near the base of the parent stem, resting on the soil, rooting at the tip, and finally tending to form a new plant, capable of independent growth when the branch is cut, or dies away, between the terminal bud and the parent plant. Certain modifications of Stolons have received distinctive names, of which the more important are: Offset, a short Stolon (*e.g.*, *Sempervivum*), and Runner, a very slender Stolon, with long, naked internodes (*e.g.*, Strawberry).

STOLONIFEROUS. Bearing, or propagating by, stolons, runners, &c.

STOMA (plural, *Stomata*; from *stoma*, a mouth). The Stomata are little openings, or mouths, in the outer covering or epidermis of the green parts of plants, through which they may be said to breathe. The air passes into the plant from the outside, bringing with it Carbonic Acid gas. This gas is broken up in the cells containing chlorophyl: all the Carbon, and half of the Oxygen, of the Carbonic Acid are retained by the plant, to be built up into starch, and other foods; and half of the Oxygen escapes from the plant into the outer air, through the Stomata. The air passing out is loaded with vapour of water evaporated from the cells of the leaf; and thus there is a constant escape, through the Stomata, of water from green parts of plants. The form and structure of the Stomata do not vary much in vascular plants; though many groups of these plants exhibit peculiarities in the form and arrangement of the cells of the epidermis that lie round the Stomata, and that are often called the "neighbour-cells"; but it is not necessary here to enter upon a description of the latter. The Stoma, or opening, lies between two sausage-shaped cells, called "guard-cells," which are joined near the ends, but leave a space between them in the middle. This opening leads into an empty space between the cells, below the epidermis, from which space crevices pass in all directions, opening into larger ones among the loosely-arranged cells in the middle of the leaf. There is a constant passage of gases into and out of the cells through the thin cell-walls that border the inter-cellular spaces, with results upon the atmosphere as stated above, if green plants are exposed to daylight. The guard-cells are usually green, owing to the presence in them of chlorophyl. They thus present a contrast to the ordinary cells of the epidermis, which contain few, if any, chlorophyl-bodies in land plants, except in Ferns, and a few others. The guard-cells regulate evaporation from plants, since they swell when full of sap, and become more convex, thus leaving a wider opening between them when a plant contains much sap and would benefit by the evaporation of some of it. In dry weather, when there has been much evaporation, the guard-cells contain less sap, and thus become straighter, and leave a narrower slit; so that evaporation becomes much slower through the Stoma when it requires to be diminished in amount. Stomata seldom occur on parts of plants habitually under ground, or under water, where they would be useless. They are most abundant on leaves, especially on the lower surface, except in some Conifers, and a few other plants, in which

Stoma—*continued.*

they are more numerous on the upper surface. Where the sides of a leaf are equally exposed to light, *e.g.*, in vertical leaves, or phyllodes, the Stomata are disposed in equal numbers on both surfaces. In floating leaves (*Nymphæa*), they occur only on the upper surface, exposed to the atmosphere. The number varies in different plants from a few hundreds to over 300,000, on a square inch of surface of a leaf, but from 20,000 to 150,000 seem to occur most frequently on that space.

Besides the ordinary Stomata for the passage of air, and of water in the form of vapour, many plants possess others of much larger size, placed singly or in groups along the edges of the leaves, above the ends of the veins. They resemble the other Stomata in form, but their guard-cells cannot move, *i.e.*, cannot alter the width of the slit between them. Their use is to permit the escape of water in drops, instead of in vapour. A familiar example of this action may be observed in *Richardia africana*, from the tip of whose leaves drops of water often fall. It is also exhibited in the drops of water that are so frequently seen on the tips of the leaves of young Wheat, and of other Cereals, in damp evenings, when evaporation is slow. The water thus exuded often has Carbonate of Lime in solution, and, as the drops evaporate, this is deposited, in such plants, in a white crust around the waterpores, as such Stomata are called.

STOMATIFEROUS. Stomata-bearing.

STONE. A hard body produced by the ossification of the endocarp or lining of certain fruits, which are commonly known as Stone Fruits; *e.g.*, Apricot, Peach, Plum.

STONECROP. A common name for **Sedum** (which *see*).

STONE ORPINE. A common name for **Sedum reflexum** (which *see*).

STONE PINE. A common name for **Pinus Pinea** (which *see*).

STONNORD. An old name for Stonecrop. *See* **Sedum.**

STOOL. A stemless "mother" plant, from which layers are annually propagated, by bending into the soil.

STORAX. *See* **Styrax.**

STORAX, LIQUID. *See* **Liquidambar imberbe.**

STORING. A term applied to the lifting of certain vegetables, principally root crops, in autumn, and placing them in sand or dry soil, under cover, where a portion can be procured for use at any time during the winter. Beetroots, Carrots, Potatoes, Salsafy, Scorzonera, &c., are well-known examples. The term is also applicable to the preservation of fruits and, indeed, almost anything which has to be housed and kept after maturity for future use.

STORK'S BILL. A common name for **Pelargonium** (which *see*).

STOVE. A plant-house devoted to the cultivation of subjects requiring a high temperature, many of which are amongst the most beautiful, either for their flowers or for their fine foliage. Where large specimens are grown, it becomes necessary to provide accommodation on an extensive scale; but, in the majority of gardens, a single Stove, or a house with a division in the centre, suffices. In a large collection, even of Stove plants, many will need a higher temperature than others: one division of a house may generally be kept hotter than the other, and so the proper requirements are met. When only one house is available, much may be done by keeping such plants as require most heat at the warmest end, and by admitting whatever air is required at the cooler end.

The best form of structure suited for a Stove is that

Stove—*continued.*

known as the span-roofed; the hip-roofed also answers well, but the wall on one side excludes a portion of the light that would be secured in the span. For the successful culture of Stove plants, particularly flowering kinds, the admission of all possible light is one of the most important conditions. When subjected to plenty of light, foliage plants also assume a more beautiful colouring, and have a shorter-jointed growth, than when situated unfavourably regarding this provision for their well-being. A plunging-bed should be provided, and heated either by hot-water pipes with cocoanut fibre above, or by tan; the latter is not always procurable, and is sometimes objected to. In large span-roofed Stoves, of from 15ft. to 18ft. in width, it is generally best to have the plunging-bed in the centre, a path down either side, and a stage next the side all round. This stage should not be of open woodwork if there are hot-water pipes beneath, but made of slate, or constructed of wood, so that some ashes or shells may be placed beneath the pots for retaining moisture.

Ventilation should be arranged so that air cannot, on entering, come in direct contact with the plants; for preventing this, it is best to place side ventilators in the walls near the pipes, and to only use others situated near the top when there is comparatively little difference between internal and external temperatures. Most Stove plants require a light shading from the summer's sun; this is best fixed on rollers, so that it may be let down and drawn up at any time, according to the weather. Generally, plenty of water and a moist atmosphere are necessary in the Stove; the plants must, therefore, be well and carefully drained, and the soil used be of an open description, whether loam or peat, in order that water may readily pass through.

In the arrangement of Stove plants, overcrowding should be avoided, as growth is rapid with many of them, and the plants soon become drawn or one-sided. Cleanliness amongst plants, and also pots, is of great importance: a high Stove temperature favours the multiplication of insects, particularly if a moist atmosphere is not always maintained.

STRAMINEOUS. Straw-coloured.

STRAMONIUM. Included under **Datura** (which *see*).

STRANGEA. Included under **Grevillea** (which *see*).

STRANVÆSIA (named after the Hon. W. Fox Strangways, F.R.S., a learned investigator of the Flora of Europe). ORD. *Rosaceæ.* A monotypic genus. The species is an ornamental, nearly hardy, evergreen, branched tree. It succeeds best when planted against a south wall, and slightly protected during severe weather. Propagation may be effected either by grafting, or by budding upon the common Thorn.

S. glaucescens (grey-leaved). *fl.* white, at length floccose; calyx persistent, the tube campanulate, the limb of five erect lobes; petals five, sessile, spreading, pilose at base; corymbs axillary and terminal, many-flowered. June. *fr.* orange-coloured, small. *l.* alternate, petiolate, simple, coriaceous, ovate-lanceolate, serrulated; stipules bristly. *h.* 20ft. Temperate Himalaya and Khasia Mountains. (B. R. 1956.)

STRATA (plural of *Stratum*, meaning anything spread out, or strewn over a given surface). A term used to denote the layers in sand or in rocks, such as may be seen in a sand-pit, a slate-quarry, or a chalk-pit. One sees the layers in cuttings as thinner or thicker bands, one above the other; and that they are spread out one above the other can be recognised if each layer is carefully removed from the surface of the one below it. By far the greater number of different kinds of rocks show layers, but some, such as granite and trap, do not. The layers, or Strata, are now believed by all geologists to

Strata—*continued.*

be the result of the sand, or other substances of which rocks are made, having been at first strewed over the surface, on the bottom of seas, lakes, or rivers, less often by wind on the dry land. Gradually, the layers were pressed down by new layers above them, and, at last, often became converted into stone. The age of the Strata can often be determined from fossils of animals and plants that have been covered up in the soft mud, and turned into stone in it. The rocks that do not show Strata have been exposed to great heat, sufficient to melt them, so that any marks of Strata in them have disappeared where they once existed, *e.g.*, in crystalline limestone.

STRATIOTES (from *stratiotes*, a soldier; in reference to the sword-shaped leaves). Water Soldier. ORD. *Hydrocharideæ.* A monotypic genus. The species, *S. aloides* (Crab's-claw, Freshwater Soldier, &c.), is a stoloniferous, submerged, aquatic herb, inhabiting Europe (Britain), &c., and resembling a miniature Aloe (see Fig. 543). Owing to the great rapidity with which it increases, its introduction into ornamental waters is not recommended.

FIG. 543. STRATIOTES ALOIDES.

STRATUM. A layer of tissue. *See also* **Strata.**

STRAVADIUM (from *tsjeria samstravadi*, the Malabar name of one of the species). ORD. *Myrtaceæ.* A small genus (about five species) of ornamental trees, now included, by Bentham and Hooker, under *Barringtonia.* Calyx three or four-cleft, with imbricated lobes. The two best-known species are described below. They require a compost of two parts loam, one peat, and one sand. Water should be given in abundance, and a moist atmosphere at all times maintained, the temperature ranging from 65deg. to 95deg. Propagated by cuttings, with leaves intact, obtained from the lateral shoots; these, taken off at a joint when the wood is ripe, and inserted in sand, with a hand glass over them, root readily.

Stravadium—*continued.*

S. album (white). *fl.* white, in very long, pendulous racemes June. *fr.* ovate. *l.* cuneate-oblong, acuminate, obsoletely serrulated. *h.* 20ft. Polynesia, &c., 1850.

S. rubrum (red). *fl.* red, in very long, pendulous racemes. June. *fr.* acutely four-angled. *l.* cuneate-oblong, acuminate, obsoletely serrulated. *h.* 20ft. to 30ft. East Indies, 1822. SYN. *Barringtonia acutangula.*

STRAW. A term applied to the above-ground stems of Grasses.

STRAW. This is of great value in gardens, as coverings for protecting plants and vegetable crops against frost; also for placing beneath Strawberry-plants in summer, to keep the fruits from being splashed and soiled by rain. Straw used for covering up potatoes, &c., during winter should be clean and dry; it should also be of a similar description, if procurable, for most purposes of protection. When obtained from stables, in the form of litter, the best may be shaken out, if necessary, and used for surrounding and covering up frames during severe weather; the value of the remainder, for mixing with leaves to form hotbeds and manure, is well known.

STRAWBERRY (*Fragaria*). Several species of *Fragaria* have contributed towards the production of the numerous kinds of cultivated Strawberries. There are few gardens in which some plants are not grown, the fruit being one favoured by everybody, and always held in high esteem. Forced Strawberries are generally the first new fruits of the year, and the operation of preparing and forcing plants is always one of the most important garden operations. It is well known that the fruits are used, when ripe, in various ways, principally for dessert, but also for cooking and preserving.

Propagation. This is effected by seeds, occasionally by division, but most generally by runners. The varieties are preserved true by the latter method; and, with some few exceptions, runners are produced in abundance during summer. The Alpine Strawberries, however, are best raised annually from seed, or, at least, the plants should not be kept more than two years. Seeds of these, and also of any others, if it is desired to raise plants by that method, should be saved from large, well-ripened fruits in summer. The fruits may be crushed, and dried on thick paper, or the pulp may be separated from the seeds by means of water, the seeds being afterwards dried. Only those which are firm and sink in the water should be kept; others that float on the surface are useless. Sow at once, or dry the seed and preserve it until the following spring. At the latter part of summer, a seed-bed, in a sheltered place outside, will answer well, if watering is carefully attended to. Pots and boxes are also suitable. Where a little warmth is at command, such as a gentle hotbed, the seedlings may be brought on rapidly to a size large enough for planting out where they are intended to fruit. Seedling Strawberries, sown early in the season, bear a little late fruit the same year, but a much better crop the year following. If any runners appear which are not required, they should be cut off at an early stage. Increasing by means of division is sometimes practised when runners cannot be secured, but it is not to be recommended, as divided

Strawberry—*continued.*

plants are never certain to succeed. It may best be done, if requisite, in early autumn, or just before growth commences in spring.

Runners afford the best and most general method of propagation. They readily root into the ground, unless it is very hard, and may be lifted with balls and replanted; but a better way is that of layering in small pots of loamy soil, and allowing them to root into it. Runners are entirely supported by the parent until they form roots of their own; this they do readily, when coming in contact with soil that is of a proper description regarding moisture, &c. If pots cannot be spared, runners for planting-out may be procured, well rooted, and in good condition for lifting, by loosening the earth and placing some light, leafy soil beneath them, just when the roots begin forming. The method of layering on pots will be further mentioned in relation to the methods of preparing plants for forcing.

Soil, Planting, &c. Strawberries grow very well in almost any good garden ground, but succeed best in rather strong loam, of a good depth, and in a somewhat moist situation. In a dry summer, the crop frequently proves a failure on plants subjected to a light soil or gravelly sub-soil, as, if flagging is once allowed, the fruits seldom ripen properly. Previous to planting, the ground should be well trenched, and plenty of good manure intermixed. Very stiff soils are not suitable, as they are so liable to cake into hard lumps, which crack open during dry weather. Stiff soils may be much improved by adding rotten leaves, peat, or leaf mould, during the trenching process.

Planting is best performed about the middle of August, or so soon as well-rooted runners can be secured. Some persons layer Strawberries very successfully for planting purposes on small pieces of turf of square or triangular shape, 1in. or more thick: the roots do not then become twisted and interlaced, as they do in pots, and a piece of turf is admirably adapted for them to enter and permeate. The turf may be sunk a little into the ground, and kept watered; in transplanting, they should be be carefully lifted with a trowel. It is not always convenient to prepare land for Strawberries at the season above named; but it is of great importance that the young plants should be put into their permanent quarters early, and receive every encouragement to get them established before winter. That showery weather should be selected, if possible, need scarcely be remarked. Land which has been occupied by early Potatoes or Cauliflowers is not unfrequently in good order for planting with Strawberries without any preparation beyond levelling down, providing the soil is sufficiently heavy, and the situation can be spared. Strawberry-plants that have been forced are available for forming an outside plantation when the fruit has been gathered; but the balls should be thoroughly soaked in water, and the leaves dipped in a soft-soap solution if they are infested with Red Spider—which is sometimes hurtful to such plants—before being put into the ground. When planting Strawberries, the soil, which should be moderately moist, must be rendered quite firm about their roots. Should the weather be dry, watering must be attended to until the plants are thoroughly established; they will need but little further attention for the season. The distance at which to plant varies a little, according to the strength of soil and the varieties. Generally, the rows should be from 2ft. to 2½ft. apart, and the plants about 1½ft. asunder in the rows; but small-fruited varieties (Black Prince and the Alpines, for instance) may be planted much closer together. The soil should never be dug between Strawberry-plants, as there are so many roots near the surface, which would be destroyed. Large weeds may be pulled occasionally by the hand and carried away, to prevent seeds dropping.

Strawberry—*continued.*

Strawberry plantations should be partially renewed every year, as young plants produce larger, and in every way superior, fruit to old ones. Three, or at the most four, years is a limit; when plants have been in one situation for this period, it is best to destroy them, provided others are coming on for a succession. The general treatment of Strawberries outside may be briefly summed up: To keep the fruit clean, the spaces between all fruiting plants should be mulched with short straw or light, clean litter, in May or June, just before the flowers open. For providing nourishment to the roots, a mulching of short, rotten manure may be spread over the surface first, and then the straw above. If runners are not required, they should be cut off at intervals, soon after being formed, unless the parents are disposed to grow too strongly to leaf, when some of the earliest may be left. At the latter part of summer, and early in autumn, considerable growth is made, and another mulching of good manure is generally of great advantage. A full crop must not be expected the following year from young plants; but, if they are put in early, a few nice fruits are generally produced, and also excellent runners for layering to force. Strawberries two and three years old bear the heaviest crops of good fruits. Watering is sometimes a necessity when the fruits are swelling, if droughts prevail or the soil is too light. A good soaking should be administered; a little on the surface is useless. A mulching of manure beneath the straw, as referred to above, helps to keep the ground cool in summer, and prevents, to a great extent, undue evaporation.

Forcing. Before successful forcing of Strawberries can be carried out, it is necessary that strong and well-ripened plants be prepared; this latter subject may, therefore, be referred to at the commencement. So soon as any runners appear, and forcing is intended, layering should be at once commenced. Perhaps the plan most generally adopted is that of layering first on small pots, and then transferring to the sizes in which the plants are intended to bear afterwards. This system is widely practised, more generally, perhaps, than any other; but that here recommended is to layer, whenever practicable, on the fruiting pots in the first instance. This entails more labour at the outset, but the necessity for a second potting is avoided. Both methods may be referred to, as some cultivators favour one and some the other.

For layering on small pots, the size known as 60s are best adapted. They should be washed clean, and then allowed to get dry; no crocks need be used, a little rough fibre from the loam placed in the bottom will afford ample drainage, the remainder being filled with loamy soil, pressed moderately firm. Strawberries for forcing should always be raised from the strongest runners procurable; these are invariably borne earliest in the season, and by plants one or two years old. A single plant is quite sufficient for one pot; it should be placed in the centre, just as roots are forming, and made secure by a peg, the runner being then pinched off just beyond the plant that is layered. Pegs made from stems of common Brake Fern answer well, as they are not required to last long. The runners take root quickly if the soil is kept moist, and soon become sufficiently established for detaching from the parent, and taking away previous to potting on for fruiting. It is important to leave them until well rooted; the check consequent on throwing the plant on its own resources in this respect, is then but little felt; whereas, if there are only a few short roots formed, the leaves often flag, and the plants are slow in recovering strength.

The customary method of proceeding with Strawberries layered on small pots is as follows: When strong roots have fairly permeated the soil, the plants are cut off, taken away, and either stood in some open situation for a few days previous to potting, or potted on at once.

Strawberry—*continued.*

The pots most generally used are of the size known as 32s, which measure about 6in. in diameter. These should be clean, dry, and well drained; a little rough turf is also recommended for placing over the drainage, and, if a sprinkling of dry soot is shaken amongst this, it will materially aid in keeping out large worms, which often enter at the bottom if they have an opportunity.

The best soil for Strawberries in pots is turfy loam, somewhat heavy rather than light, used to the extent of about two-thirds of a compost, the remainder being good, short manure, such as leaf mould, or horse-droppings which have laid for a time, or well-rotted cow-dung. Some cultivators use bone-meal or crushed bones, in preference to other manures, with excellent results. The compost should be suitably moist for ramming firmly with a hand-rammer; and it is important that none of the plants are dry at the time of potting. Stand them in a shady place for a few days, unless the weather happens to be dull, and afterwards place them in an open situation with full exposure to the sun, on a firm bottom, such as gravel or coal ashes, which allows water to pass away, and also keeps worms from entering the pots. As the plants grow, they must be stood wider apart, always allowing sufficient space between them, so that the leaves of one do not overgrow another. The crowns should be kept pointed towards the south, with a view to getting them strong and well ripened by exposure to the sun's influence. Strawberries in pots require constant attention in watering through the summer and early autumn; they need copious supplies whenever it is fine, but, in showery weather, the rain often supplies sufficient moisture for several days together, and growth made under such naturally favoured conditions is then rapid. Before there are any severe frosts, the plants should be stored away for the winter, or until they are required for forcing. They may be plunged amongst dry leaves, in cold pits or frames, where litter or some other covering can be thrown over to exclude frost. On all fine days, and during mild weather, the sashes should be removed: the plants only need protection from heavy rains and sharp frosts. Where frames or pits cannot be spared, the plan of plunging the pots in ashes, one above another, against a south wall is sometimes adopted, the pots being laid on their sides, with the crowns outwards, and all one way. Garden mats may then be laid over them at any time, if it becomes necessary.

Under the system of layering on the fruiting-pot, the mode of treatment is very similar, except that no small pots are used, and, consequently, no second potting is necessary. The large pots (6in.) should be cleaned, well-drained, and filled with good soil, at the first; then taken to the Strawberry plantation, and the selected runners placed on them, in the way previously described. Watering must on no account be neglected, not giving sufficient to cause sourness in the soil, which, it is important to remember, has to serve the roots for the season. When the plants get established, they may be detached from the parents, and afterwards treated in precisely the same way as has been already described. No check consequent on repotting is experienced by plants thus treated; and the pots may, in the first place, be filled rapidly with soil. They are not so readily taken to and from the plantation as when the small size is used; but, on the other hand, when established, they may be taken direct to the place where they are to remain for the summer, and there is no fear of injury from the roots becoming starved, because of delays that often unavoidably occur in getting the work of re-potting completed.

The preparation of plants for forcing has been thus fully detailed, because on it principally depends the success with them when introduced under glass for fruit-bearing; or, at least, superior forced fruit must not be expected if the crowns are not strong, plump, and well-ripened, at the outset. Strawberry forcing, and its attendant results, are matters of very great importance to most gardeners every season. Under successful management, good fruits may be secured some time during the month of April; earlier than this, the amount of natural heat and light necessary, through all stages, for attaining proper development, is seldom forthcoming. Some of the best-ripened plants of an early variety—such as Keen's Seedling or Vicomtesse H. de Thury—may be introduced under glass, for starting during December, or early in January. The temperature at first must not exceed 40deg. to 45deg. at night, and from 45deg. to 50deg. by day, with air on all favourable occasions. This will be sufficient to excite the crowns to push the embryo flower-stalks and leaves which they contain; but forcing must still be conducted very slowly, even until the time the fruits are set. By the time the plants reach the flowering stage, the days will have lengthened, and full sunlight must be admitted to them, with a free circulation of air—always avoiding a draught. When flowering, an average temperature of about 55deg. must not be exceeded, and the admission of air from some quarter is essential for insuring fertilisation; the atmosphere at this period should be kept somewhat drier than is advisable at any other time, till the fruits are ripe, and syringing must, for a few days, be discontinued. The strongest flowers appear amongst the first that open; and if from nine to a dozen of these can be induced to set properly, it will be a good crop, and all the smaller, secondary flowers may be clipped off so soon as these are safe. During forcing operations, it is important to remember that the four parts of a Strawberry flower are formed in succession, and that the most essential of all, the pistil, arrives last at maturity to perform its allotted function. It must not, therefore, be inferred that, when the calyx appears, and the white petals expand, the other organs are similarly advanced. In early forcing particularly, great care must be taken in regard to temperature and moisture during the whole flowering period. After the crop is set, a higher temperature should be gradually applied, about an average of from 60deg. to 65deg.; or the plants that are sufficiently advanced may be shifted into another house, if there are others coming on for a succession.

Watering must receive special attention. Plentiful supplies are requisite, especially when the fruits are swelling, and no Strawberry-plant should ever be allowed to get quite dry at the root. The application of manure-water is of great advantage while the fruits are swelling, or the plants may be assisted more conveniently, and quite as efficiently, by placing a little artificial manure over the surface of the soil once a week, and watering it in. The effect is most marked just as the first signs of colouring are seen, and this should be the last application made. Syringing may be freely practised until the fruits begin colouring; besides supplying moisture, it materially aids in keeping down Red Spider. When the earliest fruits are nearly ripe, carefully transfer the plants to a cool, airy house for two or three days before gathering; this will often improve the flavour immensely. As the crop is taken, the plants may be turned out and thrown away, or preserved for forming a new plantation, according as they may or may not be required: others will be coming on to take their places. Where large quantities of Strawberries are forced, a Strawberry-house, specially devoted to bringing on successions, is the best arrangement. This should be fitted up with beds or shelves, near the glass, where full exposure to sun and light is at all times secured. The quantity of plants forming a successional batch must

Strawberry—*continued.*

be determined by the total intended to be forced, the space available, and other conditions that are mostly of individual, and not general, application. Forced plants of Vicomtesse H. de Thury Strawberry are sometimes induced to bear a second crop in the following autumn. They are reduced a little at the root, then potted up afresh, and grown on either outside or in frames. Towards autumn, a second crop of flowers appears; and if they set well, the fruits can be ripened with fire-heat, and a fairly good crop secured, that proves invaluable for dessert, even if of second-rate quality, so far out of the natural season. The variety above named is peculiarly noted for this method of treatment; none of the others that are forced are adapted for autumn fruiting with the same degree of certainty.

Insects, &c. Few species have been recorded as noticeably injurious to the Strawberry; but this plant, like almost all other garden herbs, is liable to have the leaves and flower-buds eaten by **Surface Caterpillars**, and the roots devoured by larvæ of **Cockchafers**, and species of **Otiorhynchus**, especially of *O. sulcatus*. Information in regard to the insects, and the best means of lessening the damage done by them, will be found under the headings indicated.

In Ormerod's "Report of Injurious Insects," for 1883, is an account of serious damage done near Chester, in May and June, by the larvæ of a small Moth called in the Report the "Strawberry-leaf Button Moth," *Peronea comparana* (?). The flowers and sides of the leaflets were spun together and eaten by the larvæ, and the result was that badly-infested plants died. "Young Strawberry-plants of twelve months old are never affected; two-year-old plants are affected rather badly, but three-year-old plants are invariably ruined." The larva is cylindrical and green, with a pale yellow head, and is rather bristly. The pupa is pale green, with reddish wing-cases and abdomen. The moth, which appears at the end of June, is under ¾in. in spread of fore wings, which are pale ochreous, with a large, dark brown, triangular blotch running in from the front margin of each wing two-thirds across it; there is a dark streak inwards from the hind margin near the base of the wing. The hind wings are grey. There is probably a second brood of the insects in autumn. In the "Entomologist" for 1881 (p. 232), an attack, similar to the above, is recorded from near Blairgowrie, in Perthshire, but the moth is named *Peronea aspersana*. Yet it is the same species, perhaps, though apparently there is uncertainty about the correct name. Probably, the remedy suggested in the "Report" quoted above, of skimming the soil, to remove pupæ with it, and with the surface rubbish, would be found useful.

The leaves of Strawberry-plants that have been forced are liable to serious harm from the Red Spider (*see* **Tetranychus telarius**). During the process of forcing, Strawberries are also invariably attacked by Green Fly, which prove very destructive if not checked at first. Fumigating with tobacco-smoke is the best and most effectual remedy, but this should not be done while the plants are in flower. At any stage before flowering, or after the fruits are set, no danger need be apprehended, provided, of course, that the method of fumigating is properly carried out.

The fruit of the Strawberry is liable to be eaten by **Slugs** and **Snails** (which *see*), as well as by Millipedes, such as *Polydesmus* and *Julus* (*see* **Millipedes**). Mice, too, often prove very destructive, by nibbling off the fruits before they are ripe, or by eating the seeds, when they are at all prominent, from ripe fruits.

Fungi. The Fungi parasitic on Strawberries are few in number, and, so far as experience goes, not seriously hurtful to the plants. The most conspicuous in their effects produce spots on the leaves, sometimes in very great profusion. The spots are at first brownish-red, surrounded by a brighter red margin. After a time, the centre becomes white, by separation of the epiderm from the lower tissues, and because of the presence of air below it. In the white area lie imbedded various minute, black specks, which the microscope shows to be pycnidia inclosing sporidia, or perithecia, with spores in asci. The only Fungus of this group recorded from Britain as living on the Strawberry is *Leptothyrium Fragariæ*, which has minute, cylindrical sporidia (each with four or five dots in it) in its pycnidia. On the Continent there have also been recorded: *Ascochyta Fragariæ*, with two-celled sporidia; *Phoma fragaricola*, with one-celled, small sporidia; *Septoria Fragariæ*, with three-septate sporidia; and *Sphærella Fragariæ*, with two-celled spores in asci. The spots produced by all these are much alike; and it is doubtful in how far the various Fungi belong to species really distinct among themselves. When very abundant, they injure the leaves, and thus weaken the plants. It has been observed that plants on clay soils are more liable to attack, and that, if transferred to more open soil, they become almost free from the Fungi. No direct remedy is known, but the plants, though weakened, are seldom killed by the disease.

The fruits, when beginning to decay, in damp places, are often overgrown with moulds. The best preventive is the freer admission of air.

Sorts. Of the hybrid or large-fruited Strawberry so largely cultivated in gardens, a selection of sorts is subjoined, which includes those generally grown for forcing, and for early, mid-season, and late crops outside. Where the object is to give only a selection, and there are so many to choose from, it is not unlikely that some of those omitted are of equal merit with others included. Alpine Strawberries (*F. vesca monophylla*) are represented in Red and White varieties. The Bush Alpine is a distinct Strawberry, inasmuch as the plants produce no runners. There are red and white forms of this, which may be raised from seeds or increased by means of division. The fruits of the Hautbois Strawberry (*F. elātior*) possess a peculiar and strong flavour, which is disagreeable to some people, but much liked by others. A few plants are generally grown in gardens, but rarely a quantity. Runners are freely produced, and afford a ready means of raising or increasing a stock.

Bicton Pine. Fruit creamy-white, sometimes tinged with red where exposed to the sun, large; flesh white, juicy, of fairly good flavour. Mid-season. Plant very productive, of compact habit.

Black Prince. Fruit dark red, shining, changing almost to black when quite ripe, small; seeds prominent. The plant is a free bearer, and forces well. It is valued, both for forcing and outdoor culture, on account of its earliness.

British Queen.* Fruit light scarlet, but not always uniform in colour, frequently very large, often flattened; flesh white, very juicy and richly flavoured. When well grown, this may justly be designated the best of all Strawberries; but the plant is tender, and does not always succeed and bear satisfactorily. It is much esteemed as a late variety for forcing.

Dr. Hogg.* Fruit light red, cockscomb-shaped, very large; flesh pale pinkish-white, solid, very rich. The plant has much the appearance of BRITISH QUEEN, but is much hardier, rather later, and more prolific than that variety.

Elton. Fruit dark red or crimson, large; flesh red throughout, firm, briskly acid; plant very hardy, vigorous, and prolific. A valuable late variety, specially adapted for preserving; it is an almost certain bearer, and ripens in long succession.

Frogmore Late Pine. Fruit dark red, very large. This ripens about the same time as ELTON, and is of better flavour than that variety. Plant of free-bearing habit.

James Veitch. Fruit bright vermilion, very large and handsome; flesh solid, rich and juicy. Plant very robust. A mid-season variety; it sometimes produces fruit of unusual size.

Keen's Seedling.* Fruit dark crimson next the sun, large, roundish; flesh scarlet, rich and agreeably flavoured. This is an

Strawberry—*continued.*

old and well-known variety of great excellence; it is one of the best for forcing, and is invariably included amongst varieties for that purpose. It is also grown extensively outside, where it succeeds admirably.

La Constante. Fruit bright crimson, large, conical; flesh white, tinged red, juicy, briskly flavoured. Plant dwarf; a great bearer; rather late.

La Grosse Sucrée. Fruit dark red, medium or large; flesh pale red; flavour slightly acid. A free-bearing variety, well adapted for forcing.

Loxford Hall Seedling.* Fruit bright crimson where exposed, large, handsome, conical or sometimes cockscomb-shaped; flesh red, solid, of excellent flavour. An invaluable variety, the latest of all, of great excellence.

Lucas. Fruit deep scarlet or crimson, large, conical or sometimes cockscomb-shaped, handsome; flesh solid, highly flavoured. Mid-season or rather early. Plant free-growing and a good bearer.

Marguerite. Fruit bright red, very large, often of an unusual size; flesh juicy and tender. A productive early variety, sometimes used for forcing.

Pauline. Fruit deep red, large, with smooth neck; flesh firm, richly flavoured. A large and very early variety, and a good bearer.

Pioneer. Fruit very dark red, medium-sized; flesh solid, bright red, of rich, brisk flavour. Plant vigorous, a great cropper, one of the earliest.

President.* Fruit bright red, often very large and handsome; flesh light red, solid, highly flavoured. An excellent, free-bearing Strawberry, largely grown for forcing, and still more extensively for general crop outside.

Sir Charles Napier.* Fruit clear light scarlet, large and handsome; flesh pale, firm, briskly flavoured; seeds small, and very prominent. A most abundant bearer, and a variety very extensively grown for market; it is also well adapted for forcing. The plant is unusually tender.

Sir Harry. Fruit dark red or crimson, very large; flesh dark red, very juicy, of excellent flavour. An abundant bearer, grown extensively for market; it ripens at the same season as KEEN'S SEEDLING, which it somewhat resembles.

Sir Joseph Paxton.* Fruit bright crimson, large, even in outline; flesh solid, and richly flavoured. Mid-season or rather early. The plant is hardy, a free bearer, and forces well. This is one of the best and most useful Strawberries grown.

Vicomtesse Héricart de Thury.* Fruit bright red, medium-sized, conical; flesh pale red, solid, brisk and richly flavoured. The plant is compact, and almost evergreen; it is one of the most abundant bearers, and succeeds well forced.

STRAWBERRY-BUSH. A common name for **Euonymus americanus** (which *see*).

STRAWBERRY-TREE. A common name for **Arbutus Unedo** (which *see*).

STREBLANTHERA. A synonym of **Trichodesma** (which *see*).

STREBLORHIZA (from *streblos*, twisted, and *rhiza*, a root; in allusion to the shape of the root). ORD. *Leguminosæ.* A monotypic genus. The species is an elegant, glabrous, half-hardy, climbing shrub, allied to *Clianthus.* Loamy soil, with the admixture of a little charcoal and leaf mould, is most suitable for the culture of this plant. The compost should not be sifted, but broken up by hand, and pressed firmly in the pots. After potting, the plants should be placed in a pit with other hard-wooded subjects, and kept close for a few weeks, being syringed daily. If it is desirable to keep the plants in pots, they can be either trained out on sticks or a trellis, or on pillars or walls, for which purpose they are well adapted. Thorough drainage must be insured when planting out, and the compost may be the same as for potting, a

Streblorhiza—*continued.*

depth of about 18in. being sufficient. Abundance of water must be given at the roots, and the syringe freely used. When grown in pots, the plants will require shifting annually during March or April, previous to which all the laterals should be pruned hard back, and the leading shoots also shortened. Propagation may be effected by seeds, or by cuttings.

S. speciosa (showy). *fl.* flesh-coloured, rather large, in axillary racemes; two upper calyx teeth very short; standard ovate, erecto-patent, sub-sessile; wings short. May. *l.* impari-pinnate; leaflets few, rather large, entire, exstipellate; stipules small. *h.* 3ft. Norfolk Island, 1840. (B. R. 1841, 51, under name of *Clianthus carneus.*)

STREBLUS (from *streblos*, twisted; in allusion to the twisted branches). SYN. *Epicarpurus.* ORD. *Urticaceæ.* A monotypic genus. The species is a stove, unarmed, glabrous shrub or tree. It thrives in a compost of rich loam and fibry peat or leaf mould. Propagation may be effected by seeds; or by cuttings, inserted in sand, under a bell glass, in heat.

S. asper (rough). Paper-tree. *fl.* diœcious, the males in clustered heads, the females solitary on the peduncles. *l.* alternate, shortly petiolate, slightly toothed, rather rigid, scabrous, penniveined; stipules lateral, small, deciduous. *h.* sometimes more than 20ft. Tropical Asia.

FIG. 544. STRELITZIA REGINÆ.

STRELITZIA (named in honour of the wife of George III., Charlotte of Mecklenburgh-Strelitz). Bird of Paradise Flower; Bird's-tongue Flower. ORD. *Scitamineæ.* A small genus (four or five species) of warm greenhouse, perennial herbs, restricted to South Africa. Flowers large and showy, few in a spathe, shortly pedi-

Strelitzia—*continued.*

cellate, with a long-exserted perianth; sepals three, ovate-lanceolate, long, free; petals unequal, the two lower or front ones united, each one lobed on the outer side towards the upper part, so that the two petals are distinctly halberd-shaped, and conceal within a fold the five perfect stamens, the third or posterior petal much smaller than the other two and somewhat hooded; bracts large and spathe-like, boat-shaped, acuminate; scape terminal or in an upper axil, shortly exserted from the leaf sheaths. Leaves in long, sessile or stalked sheaths, ample, flabellately bifarious. Rhizome sometimes hypogæus, sometimes produced into an erect, woody stem. Strelitzias succeed in a mixture of two parts loam, and one part peat, with a little sand added. They require a liberal supply of water during summer; but very little need be given during winter. The principal methods of propagation are by suckers, and by division of old plants.

Strelitzia—*continued.*

posterior one nearly round, long and abruptly acuminate; spathes four, alternate, livid-green and purplish, at length 1½ft. long; scape shorter than the petioles. May. *l.* oblong, obtuse at base. *h.* 25ft. A superb plant, considered, by the authors of the "Genera Plantarum," to be specifically identical with *S. augusta.* (R. G. 235.)

S. parvifolia juncea (small-leaved, Rush-like). *fl.* purple and yellow; scape equalling the petioles. May. *l.*, blades absent or nearly so (in the type they are linear-lanceolate with flat margins); petioles resembling the stems of large Rushes. *h.* 4ft. (B. R. 516.) The variety *angustifolia* has lanceolate leaf blades, one-seventh the length of the petioles.

S. Reginæ (queen's).* *fl.* orange and purple, large, abundantly produced; scape free, equalling the leaves. April. *l.* very fine, ovate or ovate-oblong, green, mostly equal at base, broadly undulate-crisped on the margins. *h.* 5ft. 1773. This is the most magnificent species of the genus. The seeds are eaten by the Kaffirs. See Fig. 544. (A. B. R. 442; B. M. 119-20; R. G. 1877, 216.) *S. humilis* has been called a "reduced copy" of *S. Reginæ.*

S. R. Lemoinierii (Lemoinier's). A variety with golden-yellow sepals. 1880. (F. d. S. 2370-1.)

FIG. 545. STRELITZIA REGINÆ PROLIFERA, showing Habit and detached Inflorescence.

Seeds, which are also sometimes procurable, should be sown in light soil, and the pots plunged in moist bottom heat.

S. augusta (majestic).* *fl.* whitish; calyx and corolla both pure white; the sagittate petals very short and rounded, the posterior one very small, acuminate. March. *l.* dark green, distichous, 2ft. or more long, 1[illegible] broad, oblong, sub-cordate at base; petioles 3ft. to 6ft. long, slightly glaucous, longer than the scape. *h.* 10ft. 1791. A noble plant. (B. M. 4167-8; F. d. S. 173-4.)

S. farinosa (mealy). *fl.* purple and yellow; scape free, longer than the petioles. February. *l.* oblong, unequal at base; petioles half as long again as the leaves. *h.* 4ft. 1795.

S. humilis (humble). A form of *S. Reginæ.*

S. Nicolai (Prince Nicolajevitsch's). *fl.*, calyx whitish; petals blue, the sagittate ones rather large, triangular-ovate, the

S. R. prolifera (proliferous). This only differs from the type in the longer petiole and shorter blade of the leaf, and in there being two spathes developed on the same scape. See Fig. 545.

S. R. pumila (dwarf). A dwarf, compact variety. 1879.

STREPTANTHERA (from *streptos*, twisted, and *anthera*, an anther; alluding to the shape of the anthers). ORD. *Irideæ.* A small genus (only a couple of species) of dwarf, bulbous, greenhouse plants, natives of South Africa. Flower solitary in the spathe, sessile; perianth with a very short, campanulate tube, and a rotate-spreading limb; stamens affixed to the throat; spathes one, two, or three, sessile at the sides of the peduncles; peduncles two or three in the upper axils. Leaves ensiform-lanceolate, erect or falcately spreading. The

Streptanthera—*continued.*

species are very pretty when in flower. A sandy loam suits them best. Increased by offsets.

S. cuprea (coppery). *fl.*, perianth tube purple; segments of a yellowish-copper colour, purple at base and with a pale yellow spot on each side; spathe two-valved, jagged a little at the point; scape smooth, somewhat flexuous, two to four-flowered. June. *l.* distichous, acute, mucronate; lower ones smallest. Stem about 9in. high, producing two or three scapes. 1825. (P. M. B. i. 8; S. B. F. G. ser. ii. 122.)

S. elegans (elegant).* *fl.*, perianth pure white, slightly tinged with blush, with a bright purple centre, above which is a broken, black, velvety circle, marked with large, bright yellow spots; tube purple, shorter than the spathe, which is streaked with irregular, broken lines; scapes two or three, one or two-flowered. Spring. *l.* distichous, bluntish, with a very short mucro, narrowing as if cut a little above the middle. Stem about 9in. high. 1827. (L. B. C. 1359; S. B. F. G. 209.

Streptanthus—*continued.*

annuals. Seeds should be sown in the open border, late in spring; or the seedlings may be reared on a gentle hotbed, and afterwards planted out.

S. hyacinthoides (Hyacinth-like). *fl.* deep bluish-purple; sepals lanceolate, acuminate; petals spathulate-linear, the limb reflexed. September. *l.* sessile, narrow below, but clasping, oblong-linear, acuminate. Stem simple or branching, 2ft. to 3ft. high. 1834. (B. M. 3516.)

S. maculatus (spotted).* *fl.* very showy, in simple or panicled racemes; calyx purplish; petals deep velvety-purple in the middle, lighter towards the crenulate edge; pedicels 3in. to 4in. long, spreading. August. *l.* ovate-oblong, 3in. to 6in. long, glaucous, rather acute; cauline ones clasping by long and obtuse lobes. Stem 1½ft. or more high. 1833. (B. M. 3317, under name of *S. obtusifolium.*)

STREPTIUM. A synonym of **Priva** (which *see*).

FIG. 546. STREPTOCARPUS POLYANTHA, showing Habit and detached Flower.

STREPTANTHUS (from *streptos*, twisted, and *anthos*, a flower; alluding to the twisted claws of the petals in some species). ORD. *Cruciferæ.* A genus comprising, according to Asa Gray, about thirteen species of hardy, glabrous, annual or perennial herbs, natives of mostly Western North America. Flowers purple, rarely white or yellow, ebracteate, rarely bracteate, sometimes pendulous; two or all of the sepals saccate at base, often coloured, sometimes very broad; petals unguiculate, the claw straight or twisted. Leaves entire, or the lower ones lyrate-pinnatifid; cauline ones sessile or amplexicaul. Two species have been introduced; both are

STREPTOCARPUS (from *streptos*, twisted, and *karpos*, a fruit; the capsule is spirally twisted). Cape Primrose. ORD. *Gesneraceæ.* A genus comprising about a dozen species of pretty, stove or greenhouse, often villous or woolly herbs, sometimes stemless with spreading radical leaves, or rarely caulescent with opposite leaves (in some of the species, there is only one leaf in the adult state; this being, in reality, one of the cotyledons, which has developed to an enormous extent); they are natives of South and tropical Africa and Madagascar. Flowers pale, purplish, blue, or reddish, showy; calyx five-parted; corolla tube straight, declined, or incurved; limb ob-

Streptocarpus—*continued.*

liquely bilabiate, spreading, the posterior lobe bifid, the anterior and larger one trifid; perfect stamens two; peduncles scape-like or axillary, sometimes one or two-flowered, sometimes cymosely many-flowered; bracts small. Most of the species have been introduced. They thrive in any rich soil or vegetable mould; and may be readily increased by divisions, or by seeds. All are perennials, and, except where otherwise stated, natives of South Africa.

S. bifloro-polyanthus (hybrid). *fl.* pale lilac-blue; peduncles two to four-flowered. *l.* rosulate, oblong, rugose, crenate. 1882. Garden hybrid. Greenhouse. (F. d. S. 2429.)

S. caulescens (caulescent). *fl.* produced in pedunculate cymes; corolla pale lilac, ½in. in diameter. Summer. *l.* in pairs, shortly stalked, elliptic, obtuse. Stem curious, gouty, hairy, giving off leafy branches. Eastern tropical Africa, 1885. Stove. (B. M. 6814.)

S. Dunnii (Dunn's).* *fl.* 1½in. or more long, at length drooping; corolla pale or bright rose-coloured with a bright red tinge, between tubular and funnel-shaped, the lobes rounded; scapes six to eight or more, erect, 1ft. high, bearing much-branched panicles. May and June. *l.* solitary, 1½ft. to 3ft. long, sessile, horizontal and decurved, broadly oblong, obtuse, rounded at base, finely pubescent above, tomentose beneath. Stem very short. Transvaal, 1884. (B. M. 6903.)

S. Gardeni (Capt. Garden's). *fl.*, corolla 2¼in. long; tube whitish or pale green, moderately curved downwards; limb pale lilac, the lower three lobes streaked with blood-colour; scapes two-flowered. Summer. *l.* all radical and pressed close to the earth, ovate-oblong, cordate at base, on rather short petioles, crenated, downy, crisped. *h.* 6in. 1854. Allied to *S. Rexii.* Warm greenhouse. (B. M. 4862; F. d. S. 1214.)

S. Greenii (Green's). A free-flowering garden hybrid between *S. Rexii* and *S. Saundersii*, of dwarf, compact habit. 1882. Stove. (G. C. n. s., xvii., p. 303.)

S. Kirkii (Kirk's). *fl.* produced in loose, axillary, pedunculate cymes; corolla lilac, ½in. long. Summer. *l.* petiolate, cordate-elliptic, obtuse, pubescent. Stem distinct, erect, pubescent. Eastern tropical Africa, 1884. Stove. (B. M. 6782.)

S. parviflora (small-flowered).* *fl.* numerous, sub-paniculate; corolla white, with faint purplish streaks on the three lower lobes, the tube ¾in. long, the lobes ¼in. long; scapes longer or shorter than the leaves, slender, hairy. June. *l.* sub-erect, numerous, tufted, 5in. to 9in. long, 1½in. to 2in. broad, sessile, oblong or ovate- or lanceolate-oblong, obtuse, crenulate, wrinkled, densely velvety. 1882. Greenhouse. (B. M. 6636.)

S. polyantha (many-flowered). *fl.* panicled; corolla pale blue, 1¼in. long, the tube much curved, the limb very oblique, the lobes toothed; scapes one to three, 1ft. or more high. Summer. *l.* few, about two pairs, pressed on the soil, unequal in size, one of the pair being 1ft. long and the opposite one scarcely 2in., both cordate-oblong, wrinkled, and downy. 1854. Greenhouse. See Fig. 546. (B. M. 4850; F. d. S. 1168; R. G. 206; R. H. 1862, 250.)

S. Rexii (Rex's).* *fl.* bluish; calyx lobes slightly obtuse, ¼in. long; corolla 1¼in. long; scapes bibracteate above the middle, one or sometimes two-flowered. June. *l.* all radical, prostrate, ovate-oblong, crenate, wrinkled, pubescent, much wrinkled and paler beneath. *h.* 6in. 1824. Stove. (B. R. 1173; R. G. 204.) SYN. *Didymocarpus Rexii* (B. M. 3005; H. E. F. iii. 227).

S. Saundersii (Saunders')* *fl.* pale blue, drooping, on pedicels 1in. long; corolla 1¼in. long, funnel-shaped, the tube broad and nearly straight, the limb very oblique; cyme compound; scapes several. Summer. *l.* solitary, radical, 1ft. long, 8in. to 9in. broad, cordate, obtuse, velvety, coarsely serrated, pale yellowish-green above, rose-purple and very tomentose beneath. *h.* 1ft. 1860. Stove. (B. M. 5251; F. d. S. 1802; R. G. 826.)

STREPTOPUS (from *streptos*, twisted, and *pous*, a foot or stalk; alluding to the peduncles, which are abruptly bent or contorted near the middle). Twisted Stalk. SYNS. *Hekorima, Hexorima.* ORD. *Liliaceæ.* A genus comprising four species of greenhouse or hardy, perennial herbs, natives of Europe, temperate and mountainous Asia, or North America. Flowers medium, solitary or twin at the axils, nodding; perianth pink or whitish, campanulate or expanded, deciduous, the segments distinct or scarcely connate at base, sub-equal; stamens six; bracts minute or wanting. Leaves alternate, ovate or lanceolate, membranous, sessile or amplexicaul. Three of the species are in cultivation. They are interesting plants, of common culture in any light soil. Propagation may be easily effected by seeds, or by divisions.

S. amplexicaulis (stem-clasping). *fl.* on long peduncles, which are abruptly bent above the middle; perianth greenish-white, the segments ½in. long; anthers tapering to a point; stigma entire. June. *l.* very smooth, glaucous beneath, strongly stem-clasping. Stem 2ft. to 3ft. high, very smooth except at base. North America, Europe, &c. 1752. Hardy. SYN. *S. distortus.*

S. distortus (distorted). A synonym of *S. amplexicaulis.*

S. roseus (rosy).* *fl.*, perianth rose-purple, more than half the length of the slightly bent peduncle; anthers two-horned; stigma three-cleft. May. *l.* green on both sides, finely ciliated. Branches sparingly beset with short, bristly hairs. *h.* 1½ft. North America, 1806. Hardy. SYN. *Uvularia rosea* (B. M. 1489).

S. simplex (simple). *fl.* mostly solitary, rarely twin; perianth whitish, broadly funnel-shaped, five to six lines long; pedicels 2in. to 3in. long. June. *l.* oblong, acuminate, deeply cordate-amplexicaul, 2in. to 4in. long, glaucescent beneath. *h.* 2ft. to 3ft. Nepaul, 1822. Greenhouse.

STREPTOSOLEN (from *streptos*, twisted, and *solen*, a tube; referring to the form of the corolla-tube). ORD. *Solanaceæ.* A monotypic genus. The species is a very handsome, greenhouse, evergreen, scabrous-pubescent shrub. It thrives in common soil, but prefers a sandy compost. Propagation may be effected by cuttings, inserted in sand, under a glass.

S. Jamesonii (Jameson's).* *fl.* orange-coloured, pedicellate, disposed in terminal, corymbose panicles; calyx tubular-campanulate, shortly five-cleft; corolla tube elongated, spirally twisted below, enlarged above; limb of five broad, bilabiate lobes; perfect stamens four. June. *l.* entire, not very large, ovate, acute at both ends, bullate-rugose, on long petioles. *h.* 4ft. Columbia, 1847. (G. C. n. s., xxi., p. 797; R. H. 1883, p. 36; B. M. 4605, F. d. S. 436 and P. M. B. xvi., p. 6, under name of *Browallia Jamesonii.*)

STRIATE. Marked with fine longitudinal lines, streaks, or diminutive grooves or ridges.

STRICT. Very straight and upright.

STRIGILIA. A synonym of **Styrax** (which *see*).

STRIGILLOSE. Minutely strigose.

STRIGOSE. Beset with strigæ, *i.e.*, sharp, close-pressed, rigid hairs or bristles.

STRINGY BARK TREE *See* **Eucalyptus obliqua.** The name is also applied to several other species of *Eucalyptus.*

STRIPED SQUILL. *See* **Puschkinia scilloides.**

STROBILA. A synonym of **Arnebia** (which *see*).

STROBILACEOUS, STROBILIFORM. Relating to, or resembling, a strobile.

STROBILANTHES (from *strobilos*, a cone, and *anthos*, a flower; alluding to the form of the inflorescence, particularly when in a young state). Cone Head. Including *Goldfussia.* ORD. *Acanthaceæ.* A large genus (about 180 species) of stove, usually erect herbs or sub-shrubs, for the most part natives of the East Indies, a few extending as far as China and Japan, and the Malayan Archipelago, and one being found in tropical Africa. Flowers blue, violet, or white, very rarely yellow, capitate, or in strobiliform or interrupted spikes, or panicled, sessile or sometimes pedicelled; calyx deeply and nearly equally five-cleft, or two-lipped, with one lip very shortly three-toothed; corolla tubular-ventricose, straight or curved, with five ovate or round, nearly equal lobes; stamens four or two; bracts and bracteoles large or small or absent. Leaves opposite, often unequal (in *S. anisophyllus* often apparently alternate), toothed or nearly entire, often bearing raphides. The species described below are very beautiful, stove sub-shrubs, all from India, and merit a place in every collection. They are of easy culture in any light soil. Propagation may be effected by cuttings, inserted in similar soil, under a glass, in heat.

S. anisophyllus (unequal-leaved).* *fl.* lavender-colour; corolla 1¼in. long; bracts elliptic, obtuse; heads small, often cymose. June. *l.* very unequal or pseudo-alternate, lanceolate, acuminate at both ends, glabrous, 3½in. long, ⅝in. to 1in. broad, the opposite leaf of each pair 1¼in. long and ½in. broad, or obsolete. *h.* 2ft. to

Strobilanthes—*continued.*

3ft. 1823. SYNS. *Goldfussia anisophylla* (B. M. 3404), *Ruellia anisophylla* (H. E. F. 191), *R. persicifolia* (B. R. 955).

S. consanguineus (related). *fl.* blue, in compound, axillary and terminal spikes; corolla ¾in. long, the lobes ovate, acute. June. *l.* ovate, acuminate, obscurely toothed, glabrate, prominently lineolate above. *h.* 2ft. to 5ft. 1873.

S. glomeratus (clustered).* *fl.* purplish; corolla 1¼in. to 2¼in. long, glabrous; heads ovoid, sub-sessile, hairy, often pseudo-axillary. November. *l.* ovate, 4½in. long, acute, serrated, narrowed or rounded at base, villous above, less so beneath; petioles ½in. to 1in. long. *h.* 2ft. to 6ft. 1838. (B. 155, and B. M. 3881, under name of *Goldfussia glomerata.*)

S. g. speciosus (showy). *fl.* of a full, if not bright, purple, showy. (B. M. 4767, under name of *Goldfussia glomerata speciosa.*)

S. isophyllus (equal-leaved).* *fl.* lavender-colour, similar to those of *S. anisophyllus.* Autumn. *l.* opposite, nearly equal, linear-lanceolate, attenuated at both ends, glabrous, 3in. long; petioles ½in. or less in length, or wanting. *h.* 1ft. to 2ft. 1845. (B. 244 and B. M. 4363, under name of *Goldfussia isophylla.*)

S. Sabinianus (Sabin's). *fl.* lavender-colour; corolla 1¾in. long, curved, much ventricose, nearly glabrous; spikes 2in. to 4in. long, pubescent, mostly solitary. March. *l.* petiolate, broadly elliptic, shortly acuminate at both ends, 6½in. long, nearly entire; uppermost ones often sessile and cordate. *h.* 2ft. to 5ft. 1826. (B. R. 1238, under name of *Ruellia Sabiniana.*)

S. scaber (rough). *fl.* yellow; corolla symmetric, ¾in. to 1in. long, very hairy within; bracts 1in. long; spikes 1in. to 2in. long, dense, often clustered, hairy. May. *l.* elliptic or obovate, acuminate, 4½in. long, coarsely scabrous or nearly smooth; petioles ¾in. long. *h.* 1ft. to 3ft. 1836. A pubescent or hairy shrub. (B. R. xxvii. 32.)

S. sessilis (sessile). *fl.* pale purple; corolla 1¼in. long, nearly straight, slightly hairy within and without; spikes 1in. to 2in. long, cylindric, exactly strobiliform. April. *l.* sessile, ovate, acute, hairy, ¾in. to 1½in. long, rounded or nearly cordate at base. Stems numerous, erect, 1ft. to 1½ft. high. 1833. (B. M. 3902.)

S. Wallichii (Wallich's).* *fl.* blue, solitary or in pairs; corolla 1¼in. long, nearly straight, with short, round segments; lower bracts leaf-like; spikes 1in. to 6in. long, often flexuous or zigzag. October. *l.* elliptic, acuminate, 3in. long, puberulous or glabrous on petioles ¾in. long; upper ones sessile and cordate. *h.* 6in. to 2ft. 1858. (B. M. 5119, under name of *Goldfussia Thomsoni.*)

FIG. 547. OVAL STROBILES OF HOP, showing thin, membranous Bracts.

STROBILE (from *strobilos*, a Fir-cone). A scaly fruit, composed chiefly of a number of bracts that overlap one another like the slates on a roof. It is defined by Lindley as "an imbricated scaly inflorescence; a collection of hard scales, representing distinct flowers, arranged spirally but closely imbricated;" but the term is seldom employed for the inflorescences, which rather

Strobile—*continued.*

belong to the type called Catkins, and become Strobiles only when the seeds are approaching ripeness. The word Cone is employed with almost the same meaning as Strobile, though in general almost restricted to the fruits of the *Coniferæ*, while the latter word also includes the fruits of the Hop, and of a few other plants.

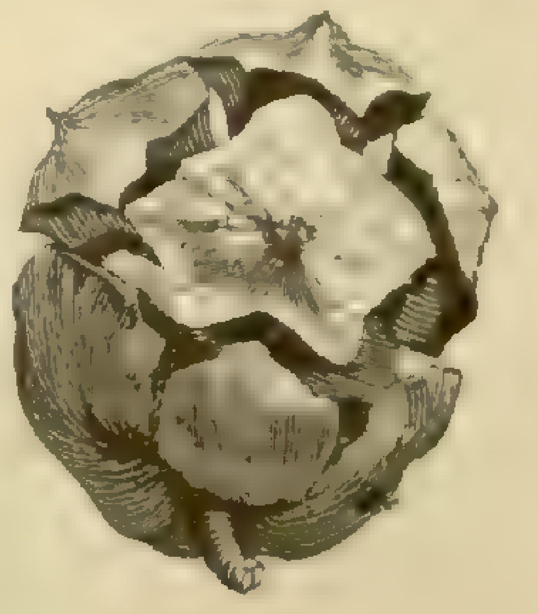

FIG. 549. ROUND STROBILE OR CONE OF CUPRESSUS, with the Scales separating, showing woody Bracts expanded into a shield-like Plate.

The Strobile is the result of the fertilisation of several flowers (there is usually one in the axil of each of the bracts of which it is composed); but the flowers are in most cases completely hidden from sight by the bracts. The latter become much enlarged as the seeds are

FIG. 550. FRUITING BRANCHLET OF JUNIPERUS COMMUNIS HIBERNICA, showing oval, berry-like Strobiles, sometimes called Galbulus.

ripening. They remain thin and membranous in some plants, *e.g.*, Hop (see Fig. 547). Among the *Coniferæ*, they usually become woody and hard; in some, *e.g.*, *Cedrus* (see Fig. 548), they remain comparatively thin; but in others, *e.g.*, *Cupressus* (see Fig. 549), each bract expands towards the tip into a broad, shield-like plate.

FIG. 548. FRUITING BRANCHLET OF CEDRUS LIBANI, bearing an oval Strobile or Cone, with thin, woody, imbricated Bracts.

In the genus *Juniperus*, the bracts become soft and fleshy, and are united by their edges, so as to form a fruit which, at first sight, very much resembles a berry

Strobile—*continued.*

FIG. 551. FRUITING BRANCHLET OF JUNIPERUS DRUPACEA, showing rounded Strobiles, with fleshy Bracts, resembling Berries.

(see Figs. 550 and 551). This form is sometimes distinguished by the name of Galbulus. In *Coniferæ*, the seeds are not inclosed in carpels; but, in most, they lie, as represented in Fig. 552, in pairs, on the upper surface of scales, of which one is present in the axil of each bract. There has been much controversy about

FIG. 552. PICEA EXCELSA, showing (1) Fruiting Branch, bearing slender Strobile, (2) Scale with Seeds in position, and (3) Seed.

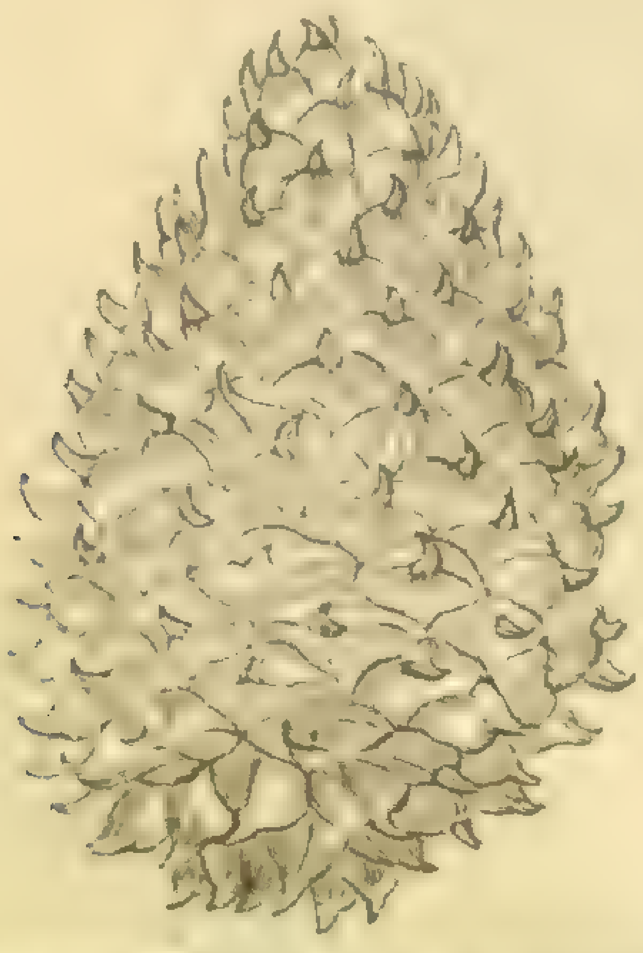

FIG. 553. STROBILE OR CONE OF PINUS PUNGENS.

Strobile—*continued.*

the true nature of the scales; but a widely-accepted view is that they represent two leaves, arising from an

FIG. 554. STROBILE OR CONE OF SEQUOIA GIGANTEA.

undeveloped branch in the axil of the bract, united together by one side, and that they correspond to open carpels.

As regards their forms, Strobiles are usually elongated cones, as, indeed, is implied in the equivalent term, Cone; but frequently they are oval or globular, and occasionally they are comparatively slender. Some of the commoner

FIG 555. STROBILE OR CONE OF PINUS SYLVESTRIS.

Strobile—*continued.*

forms are shown in the figures referred to above, and in those of *Pinus* and *Sequoia* (see Figs. 553, 554, and 555, the last being all conical).

STROBILORACHIS (from *strobilos*, a cone, and *rachis*, a flower-stem; alluding to the form of the inflorescence). ORD. *Acanthaceæ.* A small genus (two species) of stove, evergreen, Brazilian shrubs, now included, by the authors of the "Genera Plantarum," under *Aphelandra.* Bracts ample, slightly coriaceous, coloured; spikes long. For culture of *S. prismatica*, the only species which calls for description, *see* **Ruellia.**

S. glabra (smooth). A synonym of *S. prismatica.*

S. prismatica (prism-like). *fl.* yellow; corolla 1¼in. long, glabrous, funnel-shaped; bracts yellow, oval, 1in. long, pungent-pointed, rigid. June. *l.* oblong, 9in. to 12in. long, 2¼in. to 3¼in. broad, acute at base, attenuated at apex; petioles 1½in. long, glabrous. *h.* 2ft. to 3ft. SYNS. *S. glabra, Hydromestus maculatus* (B. M. 4556).

Stromanthe—*continued.*

S. amabilis (lovely). *l.* deflexed, oblong-ovate, acuminate, unequal-sided, the surface ornamented by narrow bands of dark and light green in the direction of the veins, much broader spaces of silvery-grey intervening; petioles rather tall, cylindrical. 1875. A very ornamental foliage plant. (B. H. 1875, 15-17, f. 2.)

S. Lubbersiana (Lubbers'). *l.* oblong, acuminate, irregularly wedge-shaped at base, smooth, greyish beneath; upper surface prettily marbled with yellow, pale and dark green, in spots and irregular bands. 1880. A good foliage plant. (B. H. 1882, i.)

S. Porteana (Porte's). *fl.* spicate; spikes compound, solitary or twin; rachis geniculate, villous; bracts distichous, imbricated. *l.* ovate or lanceolate, pubescent or villous, of a pleasing green above, paler beneath. 1859. A handsome, dwarf plant.

S. sanguinea (bloody).* The correct name of plant described in this work as *Phrynium sanguineum.* See Fig. 556. (F. d. S. 785.)

S. spectabilis (remarkable). *fl.*, bracts, pedicels, and calyx deep red; corolla whitish; common peduncle slender, longer than the leaves; branchlets three to five, fascicled, sub-umbellate, compound-paniculate at apex. *l.* ovate-oblong, rounded at base, glabrous, of a pleasing green above, paler beneath. SYN. *Thalia spectabilis* (L. J. F. 401).

FIG. 556. STROMANTHE SANGUINEA, showing Habit and portion of detached Inflorescence.

STROMANTHE (from *stroma*, a couch, and *anthos*, a flower; alluding to the form of the inflorescence). SYN. *Maranta* (in part). ORD. *Scitamineæ.* A small Brazilian genus (three or four species) of handsome, stove perennials. Sepals three, free, oval-oblong, slender, equalling the corolla; petals three, slightly narrower than the sepals; bracts and bracteoles spathe-like, coloured, spreading; inflorescence borne on a long and rather loose peduncle, more or less compound, often branched from the base, rarely narrow and nearly racemiform, often wholly blood-coloured. Leaves petiolate, in very short sheaths. Stems leafy, erect, slightly branched, marked with long leaf-sheaths. For culture, *see* **Calathea.**

STROMATOPTERIS. Now included under *Gleichenia.*

STROMBULIFEROUS, STROMBULIFORM. Spirally twisted into a screw shape; *e.g.*, the pods of some species of *Medicago.*

STROPHANTHUS (from *strophos*, a twisted cord or rope, and *anthos*, a flower; alluding to the produced corolla segments). ORD. *Apocynaceæ.* A genus comprising about eighteen species of stove or greenhouse, glabrous, pubescent, or villous shrubs or small trees, often climbing, natives of tropical Africa and Asia, one being found in South Africa. Flowers white, yellowish,

Strophanthus—*continued.*

orange, red, or purple, showy, rarely small; calyx five-parted; corolla funnel-shaped, the throat partly closed by ten scales; lobes five, twisted, usually produced into five very long, tail-like appendages; stamens affixed at the summit of the tube; cymes terminal, sometimes dense and few-flowered, sometimes corymbose and many-flowered. Leaves opposite, penniveined. All the species which have been introduced to cultivation are described below. They are both interesting and beautiful shrubs, of easy culture in a compost of sandy loam and peat. Propagation may be readily effected by cuttings, inserted in sand, under a glass, in a little heat.

S. Bullenianus (Bullen's). *fl.* salver-shaped, having a pinkish tube and a yellow limb marked with purplish spots, the long, tail-like apices of the limb segments being purple; cymes loosely branched. Summer. *l.* elliptic-oblong, on short petioles. Western tropical Africa, 1870. A hispid, stove climber. (G. C. 1870, p. 1471.)

S. capensis (Cape of Good Hope). *fl.* yellowish; corolla lobes 1½in. long; peduncles terminal, longer than the leaves, two to four-flowered. June. *l.* approximate, ternate, obversely lanceolate, obtuse or sub-acute, 1½in. long, attenuated into a petiole two lines long. Branches erect, glabrous. *h.* 3ft. Cape of Good Hope, 1860. Greenhouse. (B. M. 5713.)

S. dichotomus (dichotomously-branched). *fl.* whitish; tails of corolla segments purple, 3in. long; scales curled. February and March. *l.* oblong or oblong-obovate, 4in. long, acute and narrowed at base, abruptly acuminate at apex; petioles three to four lines long. Branches and peduncles dichotomous. *h.* 3ft. East Indies, 1816. Stove.

S. divergens (diverging). *fl.* greenish; throat of corolla striped with red, the lobes 1½in. to 1¾in. long; cymes few-flowered. June. *l.* elliptic-oblong, almost acute at both ends, mucronulate at apex, glabrous. *h.* 4ft. China, 1816. Stove. (B. 150 and B. R. 469, under name of *S. dichotomus chinensis.*)

S. sarmentosus (sarmentose). *fl.* reddish-purple, fasciculate, lateral and terminal, or ternate; calyx lobes ½in. long; lobes of the corolla nearly 2in. long. June. *l.* elliptic, acuminate, slightly acute at the base. Branches cylindrical, sarmentose. *h.* 5ft. Sierra Leone, 1824. Stove.

STROPHIOLE. A tubercle found surrounding the hilum of certain seeds.

STROPHOLIRION (from *strophos*, a twisted rope, and *lirion*, a lily; in allusion to the shape of the flower stem and the affinities of the plant). SYN. *Rupalleya.* ORD. *Liliaceæ.* A monotypic genus. The species, *S. californicum*, is the plant described in this work under the name of *Brodiæa volubilis.*

STRUKERIA. A synonym of **Vochysia** (which *see*).

STRUMA. A cushion-like swelling.

STRUMARIA (from *struma*, a tubercle; alluding to the style being swollen in the middle). SYNS. *Eudolon, Hymenetron, Pugionella, Stylago.* ORD. *Amaryllideæ.* A genus of greenhouse, bulbous plants. Six species have been described, natives of South Africa. Flowers numerous, in an umbel, on filiform, scarcely spreading pedicels; perianth campanulate, with scarcely any tube, the segments equal, erecto-patent; filaments more or less connected; involucral bracts two, lanceolate, the inner ones smaller; scapes solid. Leaves loriform. A selection from the introduced species is given below. Several plants formerly included here will now be found under **Hessea.** The species thrive in well-drained, sandy loam, and, after the leaves begin to discolour, require a thorough season of rest. Propagated by division, or by seeds.

S. angustifolia (narrow-leaved). *fl.* scented like those of *Lilium Martagon*; perianth white, flesh-coloured outside, the segments equal and much-spreading; scape lateral, erect, umbellately about eight-flowered. April. *l.* few, linear, slightly obtuse, flat, entire, shining; sheath radical, erect, 1in. to 2in. high. *h.* 6in. 1795.

S. rubella (reddish). *fl.* six to ten, umbellate, inodorous; perianth reddish and flesh-coloured, much spreading; bracts purplish; scape lateral, nearly 1ft. high. May. *l.* linear, oblique, slightly obtuse, entire, 5in. to 9in. long, ⅓in. broad; sheath wanting. 1795.

S. spiralis (spiral). A synonym of *Carpolysa spiralis.*

S. stellaris (starry). A synonym of *Hessea stellaris.*

S. truncata (truncate). *fl.* many, umbellate, inodorous, on slender, erect pedicels; perianth white, reddish at base, the segments much spreading; bracts purplish, erect. April. *l.* tongue-like, obtuse, nearly erect, from 6in. to 8in. long, ½in. broad, all included at base in a dark blood-coloured sheath. 1795.

STRUMOSE, STRUMIFEROUS. Bearing a struma.

STRUTHIOLA (from *struthion*, a little sparrow; alluding to the resemblance of the seeds to a beak). SYN. *Belvala.* ORD. *Thymelæaceæ.* A genus comprising about a score species of pretty, greenhouse, evergreen, Heath-like shrubs or under-shrubs, restricted to South Africa. Flowers white, red, or yellow, sub-sessile in the upper axils, solitary or rarely twin; perianth tube slender, the lobes four, spreading; stamens four, included in the tube; bracteoles two, short, narrow, stipitate. Fruit small, dry. Leaves opposite or rarely scattered, rather small, coriaceous, often loosely imbricated. The best-known species are here described. They thrive in sandy peat. Propagation may be effected by cuttings, inserted in sand, under a glass.

S. erecta (erect). *fl.* pink or white, five to six lines long, the lobes acuminate. June. *l.* clustered, linear-lanceolate, acute, spreading, one to three-nerved at back, not ciliated. Branches slender, straight. *h.* 1½ft. 1798. Shrub highly glabrous. (B. M. 2138; L. B. C. 74.)

S. lineariloba glabra (linear-lobed, glabrous). *fl.* reddish or white, scarcely ⅓in. long; lobes linear, obtuse. June. *l.* half-spreading, needle-like, convex at back, almost nerveless, glabrous. *h.* 2ft. 1820. (B. M. 222, under name of *S. erecta*; L. B. C. 75, under name of *S. juniperina.*)

S. longiflora (long-flowered). *fl.* reddish or yellowish, densely tomentose, eight to twelve lines long; lobes ovate-oblong. July. *l.* imbricated, ovate- or linear-lanceolate, slightly acuminate, rather obtuse, slenderly striated, glabrous, ciliated, at length naked, one-half or one-third the length of the flowers. Branches puberulous. *h.* 2ft. 1819. (B. M. 1212, under name of *S. pubescens.*)

S. lucens (shining). *fl.* yellow, five to seven lines long, pubescent; lobes ovate-oblong. June. *l.* imbricated, lanceolate or oblong, acuminate and acute, clasping, six to ten lines long, shining, ciliated, at length naked. Branches twiggy, pubescent above. *h.* 2ft. 1817.

S. ovata (ovate). *fl.* white or flesh-coloured, several times longer than the leaves; lobes ovate, acuminate. April. *l.* ovate or oblong, slightly acute, nearly flat, obsoletely one to three-nerved at back. *h.* 2ft. 1792. (A. B. R. 119; L. B. C. 141.)

S. striata (striated). *fl.* yellow, cano-pilose, scarcely longer than the leaves; lobes oblong, acute. July. *l.* ovate or oblong, sub-acute, flat, or the upper ones somewhat clasping, acute, striate-nerved, ciliated, glabrous. Branchlets pubescent. *h.* 2ft. 1820. (A. B. R. 113, under name of *S. imbricata.*)

S. tomentosa (tomentose). *fl.* yellow, cano-tomentose, ½in. long; lobes oblong, obtuse. August. *l.* imbricated, oval-oblong, rather obtuse, three to five lines long, three to five-nerved at back, slightly pilose; upper ones broader, half-clasping; lower ones flat, linear-lanceolate; young ones and branchlets densely cano-villous. *h.* 2ft. 1799. (A. B. R. 334.)

S. virgata (twiggy). *fl.* red; tube adpressedly pilose; lobes ovate, rather obtuse. June. *l.* opposite, three to six lines long, clustered, semi-spreading, linear or lanceolate-linear, obtuse, ciliated, or, as well as the branchlets, pubescent. *h.* 2ft. 1779. (A. B. R. 139, under name of *S. rubra*; A. B. R. 140, under name of *S. ciliata.*)

S. v. incana (hoary). *fl.* white; tube densely pubescent; limb glabrescent. *l.* ciliated, penicillate. Branchlets densely hoary or silky-villous at apex. (L. B. C. 11, under name of *S. incana.*)

STRUTHIOPTERIS. Included under **Onoclea** (which *see*).

STRUTHIUM. Included under *Gypsophila.*

STRYCHNINE-PLANT. The common name of *Strychnos Nux vomica.*

STRYCHNOS (an old Greek name used by Theophrastus for some solanaceous plants). SYNS. *Brehmia,*

Strychnos—*continued.*

Ignatia, Lasiostoma, Narda, Rouhamon, Unguacha. ORD. *Loganiaceæ.* A genus comprising nearly sixty species of stove, evergreen trees and shrubs, often tall climbers, broadly dispersed over the tropics. Flowers small or rather long, usually white, cymose, four or five-parted; corolla lobes valvate. Fruit baccate, mostly globose, indehiscent. Leaves opposite, three to five-nerved at or above the base, membranous or coriaceous. "The species of *Strychnos* contain in the bark of their root and in their seeds two alkaloids (strychnine and brucine), combined with a peculiar acid (igasuric acid)—properties which are extremely energetic; their action on the nervous system is most powerful, whether as invaluable medicines or as mortal poisons. . . . The seeds of *S. Nux vomica* act as a powerful excitant of the spinal cord and nerves, and stimulate the functions of the organs of voluntary motion, in cases of paralysis which do not proceed from injury to the brain, for which the seed itself, or an extract, or its alkaloid, strychnine, are employed . . . . *S. Ignatia* yields the Ignatius Bean of India, used as a remedy for cholera. *S. potatorum* yields the celebrated Clearing Nut of India, which clarifies foul water when this is put in a vessel of which the inside has been rubbed with it" (Le Maoût and Decaisne). *S. colubrina*, a native of Malabar, furnishes one kind of *lignum colubrinum*, or Snakewood. The pulp of the fruit of several members of this genus is edible. The species, of which about half-a-dozen have been introduced to cultivation, are of no particular value from a garden standpoint.

STUARTIA (named in honour of John Stuart, Lord Bute, 1713-1792, a zealous patron of botany). Spelt *Stewartia* by a few authors. Including *Malachodendron.* ORD. *Ternströmiaceæ.* A genus comprising only three species of beautiful, hardy shrubs; two of which are North American and the third Japanese. Flowers large or mediocre, solitary in the axils, shortly pedunculate; sepals and petals five, rarely six, the latter imbricated and cohering towards the base; stamens numerous. Leaves membranous, deciduous. The species given below merit a place in every collection of ornamental shrubs. Although sufficiently hardy to bear our winters in the open air, yet the young shoots often become injured by very severe weather, the summer not being long enough to thoroughly ripen the wood or bring the flowers to perfection; it is therefore advisable to keep the plants in the conservatory or cool greenhouse, except in favoured spots in the South of England, &c. Peat soil, mixed with a little loam, is the most suitable compost. Propagation may be readily effected by layering; or by means of ripened cuttings, inserted in sand, under a hand glass.

S. grandiflora (large-flowered). A synonym of *S. pseudo-camellia.*

S. pentagyna (five-styled).* *fl.* cream-coloured, and, as well as the leaves, rather larger than in *S. virginica*; sepals and petals five or six, the latter obovate, with jagged edges; stamens longer than in *S. virginica.* May to July. *l.* oval, acute. *h.* 10ft. North America, 1785. (B. M. 3918.) SYN. *Malachodendron ovatum* (B. R. 1104).

S. pseudo-camellia (false Camellia). *fl.* creamy-white; sepals dull reddish-brown above, finely serrulate. Summer. *l.* oval-elliptic, shortly toothed, acuminate, narrowed at the base into the reddish petiole. Branches erect, flexuose. *h.* 12ft. Japan. SYN. *S. grandiflora* (R. H. 1879, 430).

S. virginica (Virginian).* *fl.* white; sepals ovate; petals five, round-obovate, 1in. long. April and May. *l.* oblong-ovate, serrulated, softly downy beneath. *h.* 8ft. North America, 1743. (G. C. ser. ii., viii. 433; A. B. R. 73, under name of *S. marylandica.*)

STUBWORT. An old name for *Oxalis Acetosella.*

STUPOSE. Tow-like; furnished with mats or tufts of long hairs.

STURMIA. A synonym of **Liparis** (which *see*).

STYLAGO. A synonym of **Strumaria** (which *see*).

STYLANDRA. A synonym of **Podostigma** (which *see*).

STYLE (from *stylos*, a column; in allusion to its form). The narrow portion of most carpels between the ovary and the stigma. Its use is to support the stigma in such a position as to favour pollination. The cells in its centre are very loosely arranged, and form what is called the "conducting tissue," for the passage of pollen tubes from the pollen grains on the stigma to the ovules in the interior of the ovary.

STYLIDIEÆ. A small natural order of herbs or rarely under-shrubs, chiefly Australian, a few species being found in tropical Asia, or in New Zealand and Antarctic America. Flowers hermaphrodite or very rarely unisexual, in terminal racemes or thyrsoid or corymbose panicles, rarely reduced to spikes or to single flowers, the primary inflorescence usually centripetal, the secondary often, or sometimes the whole, centrifugal; calyx tube adnate to the ovary, the limb of five divisions, all free or more or less united in two lips, the upper of three; corolla usually irregular, deeply divided into five lobes, of which one (the lowest), called the labellum, is much smaller than, or different from, the others, or rarely the corolla, as well as the calyx, regularly five or six-lobed; stamens two, the filaments connate with the style in a column free from the corolla. Capsule two-valved. Leaves radical or scattered, or collected in whorl-like tufts, entire, often narrow or small. The order embraces nearly 100 species; of these *Stylidium* absorbs eighty-four, and the remainder are classed under *Forstera, Levenhookia,* and *Phyllachne.*

STYLIDIUM (from *stylos*, a column; the stamens and styles are joined). SYNS. *Candollea* (of Labillardière), *Ventenatia.* ORD. *Stylidieæ.* A genus comprising eighty-four species of beautiful but rare, greenhouse, herbaceous perennials, of which one is a native of the East Indies, and the rest are Australian (one being also dispersed over tropical Asia). Flowers in racemes, panicles, or corymbose cymes, on terminal peduncles or radical scapes; calyx lobes five, more or less united in two lips; corolla irregular, one of the lobes (labellum) much smaller and turned down, or rarely nearly as long and curved upwards, the other four ascending in pairs; column elongated and bent down or folded, elastic. Fruit a two-celled capsule, globose, linear, or lanceolate. The species best-known to cultivation are described below. They thrive in a compost of sandy loam and peat. Propagation may be effected by seeds, or, in a few cases, by division of the roots; the few shrubby kinds may be increased by cuttings.

S. adnatum (adhering). *fl.* pink, in nearly sessile clusters along the rachis; spike-like panicles or compound racemes dense, usually rather short and nearly sessile, but sometimes 6in. to 10in. long. July. *l.* scattered along the stem; upper ones crowded in a terminal, whorl-like tuft, linear, but sometimes all very narrow, in other specimens rather broad, and from ½in. to 1½in. long. Stems 2in. to nearly 12in. long. 1824. (B. M. 3816 and B. R. 1459, under name of *S. fasciculatum.*)

S. a. abbreviatum (shortened). *fl.*, inflorescence rarely above 2in. long and very dense. *l.* narrow or broad. (B. M. 2598, and B. R. 914, under name of *S. adnatum.*)

S. armeria (Armeria-like). A synonym of *S. graminifolium.*

S. Brunonianum (Brown's). *fl.* pink; calyx lobes free; corolla with appendages to the throat; raceme loose, 2in. to 4in. long, many-flowered; scapes 1ft. to 1½ft. long, with two to five whorls of narrow leaves. June. *l.*, radical ones linear to oblanceolate, acute or rarely almost obtuse, 1in. to 2in. or more long, rather flaccid. 1841. (B. R. 1841, 15.)

S. bulbiferum macrocarpum (bulb-bearing, large-fruited).* *fl.* greenish-purple; calyx lobes free, very obtuse; corolla without appendages; scapes or pedicels ½in. to 2in. long, with a loose, almost corymbose raceme of three to seven flowers. May. *fr.* almost sessile, eight to nine lines long. *l.* very narrow-linear, scarcely acute, ¼in. to over ½in. long, densely tufted at the ends

Stylidium—*continued.*

and bases of the branches. *h.* 6in. 1840. (B. M. 3913, under name of *S. recurvum.*)

S. ciliatum (ciliated). *fl.* yellow or sometimes white or pink; corolla variable in size, the appendages small or wanting; panicle or raceme short and pyramidal or narrow and 3in. to 4in. long; scape 6in. to 12in. high. June. *l.* linear, 1in. to 1½in. long, terminating in a hair-like point. 1842. (B. M. 3883; B. M. 4529 and L. J. F. 34, under name of *S. saxifragoides.*)

S. dichotomum (dichotomous). *fl.* yellow, in a more or less thyrsoid panicle or compound raceme; scapes 2in. to 4in. high, glandular-pubescent. April. *l.* crowded at the bases and ends of the branches, and scattered between the tufts, sometimes 1in. or more long, narrow-linear, acute. 1850. (B. M. 4538, F. d. S. 606, and L. J. F. 59, under name of *S. mucronifolium*; F. d. S. 229, under name of *S. Hookeri.*)

S. graminifolium (Grass-leaved).* Grass-leaved Trigger Plant. *fl.* pink, nearly sessile or shortly pedicellate; corolla lobes nearly equal, the lip rather long; scapes 6in. to 18in. high, bearing a narrow, simple raceme or interrupted spike. July. *l.* linear, rather rigid, acute or obtuse, nearly flat, variable in breadth, 2in. to 6in. or even 9in. long, sometimes cartilaginously denticulated on the margins. 1803. (B. M. 1918; B. R. 90.) *S. armeria* (L. J. F. 286) is a form with broad leaves.

S. hirsutum (hairy). *fl.* pink or red, nearly sessile, forming a dense, oblong, spike-like raceme, rarely above 1in. long, very hairy; larger corolla lobes nearly equal; lip with crisped margins and usually short appendages; scapes 6in. to over 12in. high, with spreading hairs. June. *l.* narrow-linear, acutely acuminate, 2in. to 6in. or 8in. long, glabrous or glandular-pubescent. 1830. (B. M. 3194.)

S. Hookeri (Hooker's). A synonym of *S. dichotomum.*

S. laricifolium (Larch-leaved). *fl.* pink; corolla with appendages to the lip, but usually none to the throat; panicle or raceme loose, pedunculate, often above 6in. long. July. *l.* scattered but rather crowded along the branches, not collected in terminal tufts, narrow-linear, mucronate, ½in. to 1in. long. *h.* 1ft. 1818. Sub-shrub. (B. R. 550; H. E. F. 32; B. M. 2249, under name of *S. ternifolium.*)

S. mucronifolium (mucronate-leaved). A synonym of *S. dichotomum.*

S. reduplicatum (reduplicate). *fl.* yellowish-white or pale pink, the lower ones on long pedicels; two larger corolla lobes ½in. to ¾in. long, connate to the middle; raceme short, loose; scapes leafless, 6in. to 1½ft. long, with spreading hairs. November. *l.* all radical, linear, acuminate, narrowed into long petioles, broad and nearly flat to narrow with revolute margins, 3in. or 4in. to nearly 12in. long, glabrous or minutely glandular-pubescent. 1841. (B. 213, under name of *S. Drummondii*; B. R. 1842, 41, under name of *S. pilosum.*)

S. saxifragoides (Saxifrage-like). A synonym of *S. ciliatum.*

S. scandens (climbing). *fl.* pink; corolla with more or less prominent appendages to the throat and lip; racemes terminal, solitary or two or three together, shortly pedunculate. June. *l.* all collected in dense, whorl-like, distant tufts, linear, 1in. to 2in. or more long. *h.* 2ft. 1803. Climber. (B. M. 3136; P. M. B. xv. p. 149.)

S. spathulatum (spathulate).* *fl.* pale yellow, small; corolla with appendages to both throat and lip; racemes loose, simple, elongated; scapes glabrous or pubescent, sometimes 1½ft. high. Summer. *l.* radical, rosulate, obovate to oblong-spathulate, obtuse or acute, more or less pubescent or sprinkled with glandular hairs on both sides, ½in. to 1½in. long, including the petiole. *h.* 6in. 1872. (B. M. 5953.)

STYLIDIUM (of Loureiro). A synonym of **Marlea** (which *see*).

STYLIFEROUS. Style-bearing.

STYLIFORM. Style-shaped.

STYLIMNUS. A synonym of **Pluchea** (which *see*).

STYLIS. A synonym of **Marlea** (which *see.*)

STYLOCORYNE (of Cavanilles). A synonym of **Randia** (which *see*).

STYLOGLOSSUM. A synonym of **Calanthe** (which *see*).

STYLOLEPIS. Included under **Podolepis** (which *see*).

STYLOPHORUM (from *stylos*, a style, and *phero*, I bear; indicating one of the distinctive characters). Ord. *Papaveraceæ.* A genus comprising three species of hardy herbs (nearly allied to *Chelidonium*, from which they principally differ in habit), with perennial rhizomes and yellow juice; one is North American, a second is Himalayan, and the third is found in Mandschuria and

Stylophorum—*continued.*

Japan. Flowers yellow or red; sepals two; petals four; stamens numerous; peduncles elongated, solitary or subfasciculate, at length nodding. Radical leaves pinnatifid or absent; cauline ones few, alternate, or the floral ones nearly opposite, lobed or dissected. Two species have been introduced to this country. They thrive in any light garden soil. Propagation may be effected by seeds, sown in the open border, during April; or by divisions of the root.

S. diphyllum (two-leaved).* Celandine Poppy. *fl.* deep yellow, 2in. broad; peduncles equalling the petioles. May. *l.* pale or glaucous beneath, smoothish, deeply pinnatifid into five or seven oblong, sinuate-lobed divisions; radical leaves often with a pair of smaller and distinct leaflets. *h.* 1ft. North-west America, 1854. The foliage and flower resemble Celandine. (B. M. 4867.) Syn. *S. ohioense.*

S. japonicum (Japanese). *fl.* yellow, axillary, Poppy-like. May. *l.*, radical ones long-stalked, pinnatisect. Stem slender, 1ft. to 1½ft. high, two or three-leaved. Japan and North-eastern Asia, 1870. An elegant plant. (B. M. 5830.) Syn. *Chelidonium japonicum.*

S. ohioense (Ohio). A synonym of *S. diphyllum.*

STYLOPODIUM. A term applied to an enlargement of a disk-like expansion at the base of a style, as in *Umbelliferæ.*

STYLOSANTHES (from *stylos*, a style, and *anthos*, a flower; alluding to the very long style). Pencil Flower. Ord. *Leguminosæ.* A genus comprising about fifteen species of stove or greenhouse, perennial herbs, natives of Asia, Africa, North America, and Brazil. Flowers yellow (or white?), variously disposed; calyx tube filiform, with membranous lobes; petals and stamens inserted at the apex of the tube; standard orbicular. Leaves pinnately trifoliolate, exstipellate; stipules adnate to the bases of the petioles. Several of the species have been introduced, but they are scarcely worthy of cultivation, except in botanical collections.

STYLURUS. Included under **Grevillea** (which *see*).

STYPANDRA (from *stype*, tow, and *aner*, *andros*, an anther; alluding to the downy appearance of the stamens). Ord. *Liliaceæ.* A small genus (three species) of greenhouse half-hardy, perennial herbs, with fibrous roots, natives of Australia. Flowers blue, in a very loose, terminal, dichotomous cyme; perianth at length deciduous, of six spreading segments, all equal or the inner ones broader; stamens six; pedicels filiform; bracts minute or none, or the lower ones leaf-like in the leafy species. Leaves either all radical or distichously spreading on the stem. Stem erect or ascending, sometimes woody at base. The species will succeed in an unheated pit or warm border outside, if protected in severe weather. A compost of sandy loam and peat is suited to their requirements. Increased by divisions.

S. cæspitosa (tufted). *fl.* on erect pedicels, 1in. to 2in. long, usually three or four in an umbel; perianth blue or yellowish inside, or rarely white, erect, the segments nearly ½in. long. June. *l.* mostly radical, with very short, distichous sheaths, erect, rigid, 6in. to 12in. long, ⅛in. to ¼in. broad. Stems erect, 1ft. to 2ft. high. 1824.

S. glauca (glaucous). *fl.* in a loose cyme, usually leafy at base; perianth blue, the segments very acute, about ½in. long; pedicels recurved, ½in. to 1in. long, mostly solitary. June. *l.* distichous, the sheaths usually concealing the stem, erect or spreading, linear or lanceolate, usually 3in. to 4in., but sometimes 6in. to 8in. long, two to four lines broad. Stems low or ascending, 1ft. to 3ft. high. 1823. (B. M. 3417, under name of *S. propinqua.*)

S. umbellata (umbellate). *fl.*, perianth segments white or yellowish, about five lines long. June. *l.*, radical ones numerous, 5in. to 8in. long, one to two lines broad. Stems 8in. to 10in. high, including the inflorescence, which is often reduced to a single umbel of two to four flowers on a simple scape. 1826. Very nearly allied to *S. cæspitosa.*

STYPHELIA (from *styphelos*, hard; alluding to the habit of the species). Ord. *Epacrideæ.* A genus comprising eleven species of beautiful, greenhouse, evergreen, erect or decumbent shrubs, confined to Australia.

Styphelia—*continued.*

Flowers axillary, solitary with the rudiment of a second, or very rarely two or three, on a very short peduncle; calyx usually coloured, five-parted, many-bracted, bibracteolate; corolla tube elongated, cylindrical or slightly ventricose, hairy inside at the throat; lobes five, linear, much revolute; stamens five, free. Leaves sessile or scarcely petiolate, small or elongated, acuminate, striate-nerved. The four best-known species are here described. Young plants are obtained from cuttings, in a similar way to Ericas; but, as the process takes a long time, it is advisable to purchase small plants from nurserymen. A compost of fibry peat, with the addition of about one-sixth of silver sand, is most suitable for these plants. Efficient drainage must be secured, and the new soil made firm round the ball, which should not be broken, nor the roots disturbed by the process. Water should be withheld from the roots for a few days, light overhead syringings being sufficient. As the plants progress, more air and sun should be admitted, until about the end of July, when they may be plunged in ashes outside. Watering should be carefully performed at all times. A cool greenhouse, or other structure where frost is excluded, is a suitable position for them in winter.

S. amplexicaulis (stem-clasping). A synonym of *Leucopogon amplexicaulis.*

S. longifolia (long-leaved). *fl.* green, solitary, axillary, nearly sessile; corolla tube nearly 1in. long, with five dense tufts of hairs above the base. June. *l.* long-lanceolate, gradually tapering into a fine, rigid point, concave, 1in. to 2in. long, or the lower ones still longer. Branches twiggy, softly pubescent. *h.* 3ft. 1807. (B. R. 24; L. B. C. 1583.)

S. triflora (three-flowered). *fl.* pale pink and yellow, very shortly pedicellate, solitary or very rarely two (or three?) together in the lower axils; corolla tube usually about ¾in. long. July. *l.* obovate-oblong to oblong-lanceolate, very shortly tapering to a rigid point, flat or more or less concave, rarely exceeding 1in. in length. *h.* 5ft. 1796. (A. B. R. 72; B. M. 1297; L. B. C. 426.)

S. tubiflora (tube-flowered).* *fl.* red, solitary in the axils, nearly sessile or shortly pedicellate; corolla tube nearly 1in. long, the revolute lobes very long and narrow. July. *l.* oblong-linear, sometimes slightly cuneate, abruptly mucronate, with revolute margins, about ½in. long. *h.* 5ft. 1802. (B. 142; L. B. C. 1938; P. M. B. xii. 29.)

S. viridis (green). *fl.* green, solitary in the axils, nearly sessile; corolla tube nearly ¾in. long, with five tufts of hairs inside above the base. May. *l.* oblong-lanceolate or obovate-oblong, abruptly narrowed into a short, rigid point, flat or slightly convex, less than 1in. long. *h.* 4ft. 1791. (A. B. R. 312; S. F. A. 50, under name of *S. viridiflora.*)

STYPHNOLOBIUM. Included under **Sophora** (which *see*).

STYRACEÆ. A natural order of trees or shrubs, mostly natives of the warmer parts of Asia, Australia, and America, a few being found in Northern temperate regions. Flowers usually white, rarely reddish, regular, hermaphrodite or rarely polygamo-diœcious, usually racemose; calyx gamosepalous, with five, rarely four, teeth or lobes; corolla of five, rarely four, petals, free or connate towards the base; stamens as many, or twice as many, as the corolla lobes, sometimes indefinite; disk wanting; bracts small, often minute or obsolete; pedicels ebracteolate. Fruit often baccate or drupaceous, one-seeded by abortion. Leaves alternate, exstipulate (or with minute rudimentary stipules?), entire or serrated, membranous or coriaceous, penniveined. The two balsams, Storax and Benzoin, are respectively derived from *Styrax officinalis* and *S. Benzoin.* Several of the species are employed as tea and for dyeing yellow in the Himalayas. The order embraces seven genera and about 220 species. *Styrax* and *Symplocos* are the principal genera, and include all the species, except about a dozen.

STYRANDRA. A synonym of **Maianthemum** (which *see*).

STYRAX (the ancient Greek name, used by Theophrastus, for the tree which produces Storax). Storax.

Styrax—*continued.*

SYNS. *Cyrta, Foveolaria, Strigilia, Tremanthus.* ORD. *Styraceæ.* A genus comprising nearly sixty species of greenhouse or hardy, mostly lepidote, trees and shrubs, natives of the warmer parts of Asia and America, a few being found in temperate Asia and Europe. Flowers often white, disposed in axillary and terminal, short, loose, simple or slightly-branched racemes, often pendulous; calyx campanulate, minutely five-toothed or nearly entire; corolla segments or petals five, erecto-patent; stamens ten. Fruit globose or oblong; seeds, by abortion, one, or very rarely two. Leaves entire or serrated. *S. Benzoin* yields the resin called Benzoin; and *S. officinale* furnishes a balsamic resinous substance, known as Storax. The few species introduced are (except where otherwise stated) hardy, deciduous, white-flowered shrubs; they are very handsome subjects when in flower, and hence are highly suited for shrubberies. A light soil is most suitable. Propagation may be effected by layers, in spring or autumn.

S. americana (American). *fl.* solitary or in very few-flowered racemes, nodding; petals lanceolate-oblong, ⅓in. to nearly ½in. long. Summer. *l.* 1in. to 3in. long, bright green, commonly entire, oblong or oval, mostly acute at both ends, often acuminate. *h.* 4ft. to 8ft. North America.

S. Benzoin (Benzoin). *fl.* ½in. long; pedicels thrice as long as the flowers; racemes compound, axillary, rather shorter than the leaves, hoary-tomentose. Summer. *fr.* globose, indehiscent, seven lines broad. *l.* 4in. long, oblong, acuminate, white-tomentose beneath. Branchlets covered with rusty-white tomentum. Sumatra. Stove. (B. M. Pl. 169.)

S. californica (Californian). *fl.*, pedicels with the calyx and corolla minutely canescent; style becoming 1in. long. *fr.* a bony seed, the size of a small cherry. *l.* oval, entire or sparingly undulate, 1in. to 2in. long, short-petioled. *h.* 5ft. to 8ft. California. A shrub with scurfy, stellular pubescence, at first hoary, sometimes soon green and glabrate.

S. grandifolia (large-leaved).* *fl.* mostly in elongated racemes; corolla ½in. long, convolute-imbricate in bud. Spring. *l.* obovate, acute or pointed, 3in. to 6in. long, white-tomentose beneath. *h.* 6ft. North America, 1765. (L. B. C. 1016.)

S. japonica (Japanese). A form of *S. serrulata virgata.*

S. officinalis (officinal). *fl.*, corolla often six or seven-parted; racemes shorter than the leaves, three to five-flowered. July. *l.* oval-obovate, 1½in. to 2in. long, often rounded at apex, subacute at base, hoary-tomentose beneath. *h.* 10ft. Levant (naturalised in South-western Europe), 1597. (A. B. R. 631; Fl. Ment. 60; L. B. C. 928.)

S. pulverulenta (powdery). *fl.* ½in. long, one to three together in the axils and at the tips of the branches, fragrant. Spring. *l.* oval or obovate, about 1in. long, sparingly puberulous above, scurfy-tomentose beneath. *h.* 1ft. to 4ft. South United States, 1794.

S. serrulata (slightly serrated).* *fl.*, corolla five or six-lobed, pubescent; racemes terminating the lateral branches, shorter than the leaves. Spring. *l.* oblong, acuminate, 2½in. long, acute at base, serrulated, glabrescent. Branches, petioles, racemes, and calyces fulvous-tomentose. India to Japan. A shrub or tree, sometimes 40ft. high. (B. M. 5950.)

S. s. virgata (twiggy). *l.* tapering, acuminate, usually widest below the middle. *S. japonica* (R. G. 583; S. Z. F. J. 23) only differs from this variety in having somewhat pinkish-tinted buds, with a glabrescent calyx.

SUÆDA (from *Suaed*, said to be the Arabic name of one of the species). ORD. *Chenopodiaceæ.* A genus comprising about forty species of saline herbs or shrubs, widely distributed. Flowers small or minute, axillary or clustered. Leaves ternate, fleshy, entire. *S. fruticosa* and *S. maritima* (Sea Blite; Seaside Goosefoot, &c.) are British plants; the latter is used in Southern Europe in the manufacture of Barilla (*see* remarks under **Salicornia**). None of the species possess any horticultural merit.

SUB. A prefix which, in composition of Latin words in terminology, signifies nearly, somewhat, or slightly: *e.g.*, Sub-rotund, roundish; Sub-cordate, slightly cordate, &c.

SUBEROSE. Corky in texture.

SUBLIMIA. A synonym of *Hyophorbe.*

SUBMERGED, SUBMERSED. Growing under water.

SUB-PETIOLAR. Beneath the petiole.

SUBSOIL. The layer of soil existing at such a depth below the surface that it is not reached in the usual operations of gardening and agriculture, *i.e.*, from about 1ft. below the surface downwards. In some localities, the Subsoil is of almost the same composition as the soil; but there is usually a considerable difference between them. Nor is it difficult to understand why this should be the case, in so far, at least, as regards the proportion of organic matter, and of the soluble foods of plants, in each; for plants draw a large share of their nourishment from the surface soil, and thus impoverish it of the substances used by them. On the other hand, such plants as die and decay on any piece of ground increase the proportion of organic matter in the surface soil, but add little, if any, to the Subsoil. The physical texture of the surface soil is also rendered more open by the numerous roots that traverse it; and this greater looseness is much increased by the operations of cultivation. The freer access of air and rain thus afforded permits a more rapid decomposition of the soil. The looser texture also permits rain-water to trickle down till it reaches the Subsoil, carrying with it soluble compounds out of the surface soil. If the Subsoil is clay, it retains what is carried down in this way, whether such additions are useful as food for plants, or poisonous to them. Hence, the Subsoil may become rich, so as to yield excellent crops when exposed to air and light; or it may be almost barren until the poisonous substances in it (*e.g.*, Oxides of Iron) have been changed, by the action of natural agents, such as air and rain, or by the operations of agriculture, into harmless compounds.

The nature of the Subsoil exercises a very important influence on the fertility of the surface soil. If it is open and sandy, it allows the rain-water to drain away rapidly; hence, there is no reserve, in times of drought, to supply the place of that evaporated from the surface of the soil, and from the plants thereon, which suffer in their growth, or perish for lack of water. If, on the other hand, the Subsoil is clay impervious to water, the rain is caught, and collects in hollows, where it stagnates, with the usual ill-consequences of the surface soil becoming saturated and cold, and being rendered sour by the formation in it of organic acids, from the action of the water on decaying plant-remains. Clay Subsoils must, therefore, be broken up by the Subsoil plough, or by the spade and fork; but they should be well drained about one or two years before they are broken up, as *wet* clay coheres very quickly if merely cut through. Excellent results often follow the bringing of the Subsoil to the surface, by means of Subsoil ploughs or spades; and it is evident, from what is said above, that it must be an advantage to bring within reach of the roots of plants new soil, richly supplied with substances required by them, and that have been used up, to some extent, in the surface soil. Moreover, the new soil, when exposed to the atmosphere and frost, breaks up, and affords new food supplies, in addition to those washed into it by rain from the higher layers.

Where the Subsoil contains poisonous substances, it should not be disturbed, unless it is possible to let the ground lie fallow for a year or more. In this time, the danger will probably be removed by the action of the atmosphere upon the hurtful substances. To ascertain whether the Subsoil is hurtful, the following method has been employed: A flower-pot is filled with the Subsoil to be tried, and another is filled with ordinary soil, for comparison of results. Seed of the same kind is sown in both, and, if the Subsoil gives a good crop, this shows it to be safe, and worth bringing to the surface; but, if the crop is sickly and weak in the Subsoil, while good in the other pot, the Subsoil is evidently unwholesome in its natural state, though it may be rendered fertile by exposure, for a time, on the surface.

SUB-SPECIES. A rank higher than that of Variety, but lower than that of Species.

SUB-TROPICAL GARDEN. A term applied to a portion of a flower garden or pleasure-ground devoted, during summer, to stately-habited foliage plants, which are arranged with a view to represent tropical vegetation. Many of the plants used are natives of tropical countries, and are, consequently, only available for placing outside during the hottest part of the year; but there are others of stately aspect which are quite hardy, and are invaluable for associating with them. Tropical plants of slow growth, which have to be kept under glass all the winter, require a great deal more space than can generally be afforded them; and as they are also very expensive subjects to procure in the first place, comparatively few gardeners have any at their command. One of the most important provisions for sub-tropical plants is shelter; their leaves in most instances are soon torn, and the plants disfigured, if exposed to rough winds. Shade and moisture are also necessary for many Tree and other Ferns and Cycads. There are numerous sub-tropical plants which may readily be raised from seed each spring, as they are quick-growing, and form quite large specimens before autumn, when planted out about the middle of June, in rich soil. Of these *Albizzia lophantha*, Castor-oil plants (*Ricinus*) in variety, Nicotianas, Solanums, Wigandias, and varieties of *Zea* are specially valuable. Cannas, too, may readily be raised from seeds in spring; but the plants are nearly hardy, and may afterwards be increased by division of the rootstock in spring. Of tropical plants the most serviceable are: amongst Palms—*Chamærops humilis*, *Livistona australis*, *L. chinensis*, *Phœnix dactylifera*, *Ptychosperma Cunninghamiana* (often known in gardens as *Seaforthia elegans*), *Trachycarpus excelsus* and *T. Fortunei*. Musas—*M. Ensete* and *M. superba*. Tree Ferns—*Alsophila australis* and *A. excelsa*, *Cyathea dealbata*, *Dicksonia antarctica*. *Cycas circinalis* and *C. revoluta* may be plunged in sheltered positions along with the plants above-mentioned. Amongst other subjects also available are Arundinarias, Bambusas, Centaureas, Cordylines, Erythrinas, Fatsias, three or four species of *Ficus*, Funkias, the New Zealand Flax (*Phormium tenax*), Pampas Grass, &c. Other remarks on this subject will be found under **Garden**, and the descriptions and culture of plants referred to are given under their respective headings.

SUBULARIA (from *subula*, an awl; alluding to the form of the leaves). Awlwort. ORD. *Cruciferæ*. A monotypic genus. The species, *S. aquatica*, is an annual, aquatic herb, indigenous in Europe (Britain), Siberia, and North America. It has no value as a garden subject.

SUBULATE, SUBULIFORM. Awl-shaped.

SUCCISA. Included under *Cephalaria* and *Scabiosa*.

SUCCISE. Abruptly cut or broken off at the lower end.

SUCCORY. Another name for **Chicory** (which *see*).

SUCCOVIA (named after Professor Geo. Suckow 1751-1813, a botanist of Heidelberg). ORD. *Cruciferæ*. A monotypic genus. The species, *S. balearica*, an annual, with yellow flowers and pinnatisect leaves, native of the Canary Islands and the Mediterranean region, is probably not now in cultivation.

SUCCUBOUS. When, in leaves crowded on a stem, the base of each leaf covers the apex of the next below.

SUCCULENT. Very cellular and juicy.

SUCCULENT PLANTS. Amongst these are included numerous genera of plants which are extremely varied in habit, but mostly all have leaves of a soft, succulent nature. Very few are hardy subjects compared with those which need glass protection: still, a large number require but little artificial warmth. The natural order *Cacteæ* includes a large proportion of Succulent Plants, many being exceedingly curious, and others very beautiful. The following are representative genera amongst Succulents: *Agave, Aloe, Cereus, Cotyledon, Crassula, Echinocactus, Epiphyllum, Gasteria, Haworthia, Mammillaria, Mesembryanthemum, Opuntia, Phyllocactus, Sedum, Sempervivum.* For carpet-bedding purposes, some of the dwarf Succulents are invaluable—as, for example, Sedums, &c.

SUCCUTA. A synonym of *Cuscuta.*

SUCKER. A shoot of underground origin.

SUCKERING IRON. A garden tool used for removing suckers from fruit-trees, &c. It consists of a narrow, steeled blade, to which a shank and socket are attached, wherein to insert a handle somewhat like that of a spade. The entire length is about the same as that of the latter implement, but the blade is usually only 6in. long by 3in. broad, at the cutting edge. The handle is much shorter, and the shank and socket, combined, longer.

SUCKERS, PROPAGATION BY. *See* **Propagation.**

SUFFRUTESCENT. Slightly shrubby.

SUFFRUTICOSE. Low and shrubby at base.

SUGAR BERRY. The fruit of *Celtis occidentalis.*

SUGAR BUSH. A common name for **Protea mellifera** (which *see*).

SUGAR CANE. The popular name for **Saccharum officinarum** (which *see*).

SUGAR PEA. A name given to edible-podded Peas. *See* **Pea.**

SUGAR PINE. *See* **Pinus Lambertiana.**

SUKANA. A synonym of *Celosia.*

SULCATE. Furrowed or grooved.

SULPHUR. An element constantly present in protoplasm, though only in a very small amount. It is believed to be essential to living beings, and is supposed to be taken by plants from the soil, in Sulphate of Calcium, absorbed in solution by the roots. The sulphate is probably broken up on contact with the oxalates that are formed during growth, and the Sulphur is built up into organic compounds of the protoplasm group. The use of Sulphur to plants is, however, uncertain.

Sulphur as a Remedy. Sulphur is a very useful remedy against the attacks of the Mildew Fungi (*see* **Mildew** and **Oidium**) that live on the surface of the green parts of plants It is used in the form of "Flowers of Sulphur," dusted upon both surfaces of the leaves, and of young shoots, by means of a **Sulphurator** (which *see*). The operation should be performed while the plants are still wet with dew. In this way, Sulphur is applied to Roses, Hops, Vines, &c., usually twice or thrice in a season; but it must be done at such periods as will permit of the Sulphur being all washed off any part that is afterwards to be made use of in food (*e.g.*, Grapes or Hop catkins), before they are gathered. The Sulphur destroys the mycelium of such external Fungi. Weak solutions of Potassium Sulphide have been found to act equally as well as the powder, and are now coming into general use. Dusting with Flowers of Sulphur is a remedy also sometimes employed against larvæ of Sawflies, and of Moths; and both the powder and solutions of Potassium Sulphide are used to destroy

Sulphur—*continued.*

Green Fly and Red Spider. For the latter, the modes of treatment recommended are to syringe the plants, and then to scrub as vigorously as may be permitted, or to dip the shoots into the solution, which is prepared by carefully mixing 4oz. of Sulphide of Calcium with 2oz. of soft soap, and then adding hot water up to one gallon in all. This solution should be made use of twice or thrice, and will be found a most useful application; or fluids containing Sulphur, *e.g.*, Gishurst Compound and Veitch's Chelsea Blight Composition, may be employed with success.

SULPHURATOR. An apparatus or appliance for distributing Flowers of Sulphur over plants attacked by Mildew, &c. It consists of a small bellows with a small tin box above the tube, having holes in the bottom. The sulphur is placed in this box, and as it shakes through into the tube it is expelled, wherever desired, by the action of the bellows.

SULPHURIC ACID, or **OIL OF VITRIOL.** In horticulture, this substance is of little use; for, though weak solutions (one part in fifty of water) have been used for syringing plants to destroy insect pests, it can be employed with safety only for hardy subjects; and there are various solutions preferable for use in this way. Sulphuric Acid is largely used in the preparation of soluble phosphates for manure. The sulphates, or compounds of Sulphuric Acid, are of considerable value. Solutions of Sulphate of Copper (Blue Vitriol) and of Sulphate of Soda are employed as washes for seeds of Oats, Barley, and other Cereals, to cleanse them from spores of the Smut Fungus (*Ustilago segetum*), and also against Bunt (*Tilletia caries*) in Wheat and in Barley. In like manner, Sulphate of Copper solution (one ounce to a gallon of water) is a valuable insecticide when syringed on plants.

Sulphates are often used as manures. Sulphate of Ammonia, prepared from gas-liquor, by the addition of Sulphuric Acid to it, or to the Ammonia that is removed from the liquor when steam is forced through it, has been found to add largely to crops when given as manure. It supplies Nitrogen in a form readily taken up by plants; but the amount should not exceed 1cwt. per acre. In the South of England, Sulphate of Lime, or Gypsum, is frequently used, in quantities of from 2cwt. to 10cwt. per acre, for Beans, Peas, and other leguminous plants, for which it is especially valuable, and with which it gives excellent results. In Germany, it is used for pastures, and also, to a less amount, for other produce. It is mostly burned and reduced to powder before being applied.

SUMACH. *See* **Rhus.**

SUMACH, MYRTLE-LEAVED. A common name for *Coriaria myrtifolia.*

SUMMER BEDDING. Most people are acquainted with this term, which applies to the planting of flower beds annually for a display through the summer and early autumn. It is usually carried out at the latter part of May and through June, the seasons varying a little according to locality. In Summer Bedding, Pelargoniums play the most conspicuous part; Alternantheras, Calceolarias, Coleus, Heliotropes, Iresines, Lobelias, Pyrethrum (Golden Feather), Verbenas, &c., are also largely employed. *See also* **Bedding-out.**

SUMMER SNOWFLAKE. *See* **Leucoium æstivum.**

SUN-BURNING. A term applied to injuries of various parts of plants, attributed, with more or less reason, to exposure to the rays of the sun in confined spaces, or where the heat is concentrated through glass or water, or by reflection from walls or other objects. Probably, both heat-rays and light-rays are concerned in

Sun-burning—*continued.*

the result; but it is impossible to determine the share due to each. A very rapid rise of temperature, after severe cold, is also apt to produce results included under the general name of Sun-burning.

Most plants, if exposed for some time to a temperature between 105deg. and 125deg. Fahr., are killed; but certain fleshy subjects, particularly species from tropical deserts, are able to resist even a higher temperature than 125deg. When plants that have been in a greenhouse all the winter are first put out of doors, in spring, the leaves often become brown and look scorched. These organs may die and wither, or may only become red or brown, and afterwards reassume their natural green colour. Plants do not usually suffer serious injury from this cause, though often checked in their growth for a time.

In ill-ventilated glasshouses, it often occurs that the leaves of many of the plants show round, pale, withered spots. Observation teaches that these follow the presence on the leaves, during sunshine, of drops of water; and it has been suggested that the drops act like miniature burning-glasses, focussing the rays upon the spots below them, and destroying the protoplasm by the excess of light and heat so caused. Inequalities in the glass of greenhouses are believed to give rise to similar injuries. Whatever may be the cause, experience has proved that thorough ventilation is the best preventive, and that, if this is attended to, the evil will be much diminished, if not wholly cured.

Sun-burning and *Sunstroke* are terms applied to injuries of the stems of trees, consisting sometimes in the bark dying, and separating from considerable surfaces, or in long strips, on the side most exposed to the sun's rays. Sunstroke is apt to occur in trees exposed by the removal of others or of undergrowth, or it may follow the erection of walls or other reflectors of heat in the immediate neighbourhood of the stems. It injures both fruit-trees (especially Peaches) and forest-trees when suddenly exposed. The cause of injury is the death of the newly-formed cells of the cambium layer by exposure to excessive heat. In trees suddenly exposed to variations in temperature greater than they had previously to bear, the bark is not sufficiently developed to protect the cambium from injury, and the result is as just described.

Splitting of the bark is apt to occur in spring, when trees have been exposed for some time to keen frost, followed by a sudden rise of temperature. The injury is due to unequal expansion of the bark and the wood. Probably, it is more often caused by the preceding frost than by the warmth, the thaw only bringing to view the harm already done. But that Splitting is, to some extent, connected with the sun's warmth is shown by its greater frequency on the side of the trunk that receives most of the sun's rays. Both Sun-burning and Splitting are far commoner on the Continent than in Britain, where the extremes of heat and cold are seldom such as to give rise to either. The best preventive of both is to protect the trunks and branches that may be in danger, by some simple means of shelter, such as wrapping them in straw, or coiling a straw-rope around them.

A few years ago, Dr. H. Müller, of Thurgau, called attention to the loss of grapes that occurs in various places in Germany when cold, damp weather is suddenly followed by bright, warm, sunny days. In the unripe clusters that are exposed to the direct rays of the sun, many of the grapes become pale, and then shrivel and turn brown. Sometimes, the stalks of the clusters turn brown before the grapes show signs of injury, but the latter soon shrivel and die when the stalks are killed. Experiments show that the cause of injury is excessive heat, and that similar results follow when clusters are exposed to artificial heat as great as that to which they are subjected under natural conditions, *i.e.*, between 105deg. and 115deg. Fahr. The risk of injury is greater in proportion as the fruit is more juicy. The moister the atmosphere, the less must be the evaporation from the fruit; hence, in moist weather, evaporation cannot act as a means of keeping down the temperature, and this probably explains how the harm done is greater after a continuance of wet weather, as the air is then nearly saturated with moisture. The risk is much less in England than in Germany, as the temperature is seldom so high in our islands as to do injury. Prevention may be secured by any method of shading the clusters. The best protection is that afforded by the leaves of the Vines themselves; hence, the removal of the leaves to hasten ripening is seldom to be recommended.

Though not strictly included under Sun-burning, a few remarks may be added on the harm done by dry, windy weather to many plants that grow in moist soil. If exposed for some days to dry, warm winds, the leaves of such plants wither and die, becoming so brittle as to crumble into dust when rubbed in the hand. Under similar conditions, the same species of plants growing in drier ground may scarcely be injured. The cause is as follows: The damper the localities in which plants grow, the more are all their green parts adapted for rapid evaporation. While the evaporation is balanced by the amount of water absorbed by the roots, and carried up by the stems, growth goes on rapidly, and the plants grow luxuriantly, unless the mineral matters absorbed with the water accumulate to a hurtful degree, when the plant will become weak and sickly. But in dry, warm weather, the loss by evaporation exceeds the amount that can be supplied to the leaves; hence, they wither, and dry up. Those that suffer most are the mature leaves in the active discharge of their functions, the older and younger ones being far less severely injured. The only remedial means applicable is to shelter the choicer plants from wind and sunshine as much as possible, and to syringe their leaves occasionally. Watering the soil is of no use, as it is already too moist. On such ground, drainage is the most efficient means of preventing injury to the plants from drought.

SUNDEW. *See* **Drosera.**

SUNDROPS. A name applied to *Œnothera fruticosa.*

SUNFLOWER. A popular name for the species and varieties of *Helianthus*, but more particularly applied to the varieties of *H. annuus*, which may readily be raised from seed each year. Sunflowers are best adapted for planting at the back of large shrubbery borders or in wild gardens.

SUNIPIA (said to be the native name in Nepaul). ORD. *Orchideæ.* A monotypic genus. The species—a stove, epiphytal orchid, with small, racemose flowers, lateral, elongated, leafless scapes, and a coriaceous, slender, many-veined leaf—is a native of Java, and awaits introduction to this country.

SUN-PLANT. A popular name for *Portulaca grandiflora* and other species.

SUN ROSE. *See* **Helianthemum.**

SUPERIOR. Growing above anything. The posterior or upper lip of a corolla is the Superior. "A calyx is Half-superior when it appears to grow from above the base of an ovary, and absolutely Superior when it appears to grow from the top of the ovary. On the contrary, the ovary is Superior when it grows above the origin of the calyx" (Lindley).

SUPERPOSED. Stationed vertically above some other part.

SUPERVOLUTE. When one edge is rolled inwards, and is enveloped by the opposite edge also rolled inwards: *e.g.*, the leaves of an Apricot-tree.

SUPINE. Lying flat, with face upwards.

SUPPRESSION. Complete abortion.

SUPRA. A term which, used in Latin compounds, signifies above; *e.g.*, Supra-axillary, growing above an axil; Supra-foliaceous, growing above a leaf.

SUPRA-DECOMPOUND. Many times compound: *e.g.*, the leaves of Carrot, Fennel, &c.

SURCULOSE. Producing suckers.

SURCULUS. A sucker; a shoot rising from underground.

SURFACE CATERPILLARS, or **SURFACE GRUBS.** The larvæ of several species of Moths, chiefly *Triphœna pronuba*, *Agrotis segetum*, and *A. exclamationis*. The name is given to these larvæ because of their habit of living just below the surface of the soil during the day, coming out to feed at night on low plants and herbs. They are much in the habit of gnawing through the stems of herbaceous plants below the soil, just where the stems join the roots, and thus cause the plants to wither without any evident reason. In winter, they also frequently eat their way into fleshy tubers (potatoes) and tuberous roots (turnips, &c.), Asters, many weeds, &c., and do considerable damage. In spring, the larvæ become pupæ in earthen cocoons; and in summer, the moths emerge. Plants suffer most from the larvæ in ungenial summers, when growth is slow; and the damage then done permanently injures them. Rains occasionally enable plants to recover, even when they have suffered severely. Further information about these larvæ will be found under **Noctua**; and the best remedies are mentioned under that heading.

SUSARIUM. A synonym of **Symphyostemon** (which *see*).

SUTHERLANDIA (named in honour of James Sutherland, Superintendent of the Royal Botanic Garden at Edinburgh; he published, in 1683, "Hortus Medicus Edinburgensis"). ORD. *Leguminosæ*. A monotypic genus. The species is a canescent, half-hardy shrub, very handsome when in flower. It succeeds best in a compost of loam and peat; and may be readily increased by seeds, or by young cuttings.

S. frutescens (shrubby).* Bladder Senna of the Cape. *fl.* scarlet or bright red, handsome, in axillary racemes; calyx five-toothed; standard oblong, shorter than the boat-shaped keel; wings very short. June. *fr.* a curious, papery, inflated, many-seeded pod. *l.* impari-pinnate; leaflets numerous, elliptic or oblong, entire, exstipellate; stipules small, narrow. *h.* about 3ft. South Africa, 1683. (B. M. 181, under name of *Colutea frutescens.*)

S. f. microphylla (small-leaved). *fl.* two or three to a peduncle. *l.*, leaflets oblong-linear, glabrous above, pubescent beneath. 1816.

SUTRINA (said to be the native name in Peru). ORD. *Orchideæ*. A monotypic genus. The species—a dwarf, stove, epiphytal orchid, with scattered-racemose, medium-sized flowers, an erect, simple scape, coriaceous leaves, and a very short, one or two-sheathed stem—is a native of Peru, and is unknown to cultivation.

SUTTONIA (named in honour of the Rev. Dr. Sutton, 1756-1846, an English botanist). ORD. *Myrsineæ*. A small genus of greenhouse, evergreen shrubs or small trees, natives of New Zealand and the Sandwich Islands. *Suttonia* is now included, by Bentham and Hooker, under *Myrsine*; it only differs in having its petals free as far as the base, and its stigma sub-sessile. The only

Suttonia—*continued.*

species calling for mention here is *S. australis*. For culture, *see* **Ardisia.**

S. australis (Southern). *fl.* minute, in capitate, lateral fascicles. *l.* 1in. to 1½in. long, oblong or obovate, obtuse, coriaceous, undulated, much-veined, studded with rounded, pellucid glands. *h.* 8ft. to 10ft. New Zealand. A perfectly glabrous shrub, with its bark nearly black. Its proper name, according to Hooker, is *Myrsine Urvillei.*

SUTURE. The line of junction of two different parts. Sutural dehiscence is the act of splitting along the line of junction of two valves.

SWAINSONA (named in honour of Isaac Swainson, F.R.S., a celebrated cultivator of plants, about the end of the last century, at Twickenham). Including *Cyclogyne*. ORD. *Leguminosæ*. A genus comprising about twenty-three species of very elegant, greenhouse herbs or sub-shrubs; one is a native of New Zealand, and the rest are Australian. Flowers bluish-violet, purple, red, rarely white or yellow, disposed in axillary, often pedunculate racemes; calyx teeth sub-equal, or the two upper ones shorter; standard orbicular or reniform, spreading or reflexed; wings oblong, falcate or slightly twisted, often shorter than the broad, incurved keel; bracts membranous, usually narrow or small. Pods ovoid or oblong, turgid or inflated. Leaves impari-pinnate; leaflets numerous, entire, exstipellate; stipules usually herbaceous, rarely bristly. The species best known to cultivators are described below. They are all Australian, and well deserve a place in every greenhouse, thriving in a mixture of sandy loam and peat. Propagation may be readily effected by young cuttings, inserted in sand, under a glass; or by seeds.

S. atrococcinea (dark scarlet). Probably a garden name for a form of *S. galegifolia.*

S. canescens (hoary). *fl.* blue or violet-purple, variegated with pink, and with a green blotch at the base of the standard, nearly sessile; calyx silky-hairy; keel much curved; racemes many-flowered, on long, silky-villous peduncles. May. *l.*, leaflets nine to fifteen, obovate or oblong-elliptic, obtuse or retuse, ½in. to 1in. long, nearly glabrous above, softly pubescent beneath. Stock woody, with erect, but herbaceous, stems, 1ft. to 2ft. high. (P. M. B. vii. 199, under name of *Cyclogyne canescens.*)

S. coronillæfolia (Coronilla-leaved). A form of *S. galegifolia.*

S. galegifolia (Galega-leaved).* *fl.* deep red, rather large; standard having prominent callosities above the claw; racemes pedunculate, exceeding the leaves, and sometimes twice as long. July. *l.*, leaflets eleven to twenty-one, or rarely more, oblong, obtuse or emarginate, mostly ¼in. to ¾in. long. 1800. A glabrous perennial or sub-shrub, with erect, flexuous branches, 1ft. high, or sometimes climbing to several feet. (L. J. F. 304, under name of *S. Osbornii*; A. B. R. 319, under name of *Vicia galegifolia*; B. M. 792, under name of *Colutea galegifolia.*) *S. albiflora* (B. R. 994; L. B. C. 1642) is a form with white flowers, and *S. coronillæfolia* (B. M. 1725) has light purplish-pink flowers. The plants in gardens under names of *S. atrococcinea*, *S. magnifica*, and *S. purpurea* are probably forms of this species.

S. Greyana (Grey's).* Darling River or Poison Pea. *fl.* pink, large, in long, erect, pedunculate racemes; calyx densely cottony-white, longer than the pedicels; standard ¾in. in diameter. July. *l.*, leaflets eleven to twenty-one, oblong, obtuse or retuse, ¾in. to 1in., or sometimes 1½in., long. Stems erect or ascending, 2ft. to 3ft. high. 1844. Perennial herb or sub-shrub. (B. M. 4416; B. R. 1846, 66.)

S. lessertiifolia (Lessertia-leaved). *fl.* violet-purple, rather small, in short racemes, sometimes reduced to umbels or heads, on peduncles longer than the leaves; standard without callosities. July. *l.*, leaflets nine to fifteen, or rarely more, oblong, obtuse, mucronate, or almost acute, ¼in. to 1in. long. Stems diffuse or ascending, 1ft. to 1½ft. high. 1824. Perennial herb.

S. magnifica (magnificent), of gardens. Probably a form of *S. galegifolia.*

S. occidentalis (Western). *fl.* purple, numerous, in long, pedunculate racemes; calyx sparsely hairy; standard ½in. broad, but not so long. Summer. *l.*, leaflets eleven to seventeen, or occasionally more, oblong, obtuse, or acute, ½in. to nearly 1in. long. Stems usually erect, and bent in zigzag form at the nodes. *h.* 2ft. to 3ft. A glabrous or pubescent perennial. (B. M. 5490.)

S. procumbens (procumbent). *fl.* violet or blue, large and fragrant, disposed in a loose raceme, on a peduncle often attaining 1ft.; standard about 1in. long, deeply emarginate, without callosities; keel much incurved. Summer. *l.*, leaflets eleven to

Swainsona—*continued.*

twenty-one or more, varying from oblong or almost linear, and ¼in. to ½in. long, to lanceolate or linear, acute, and upwards of 1in. long. Stems procumbent, ascending, or erect. 1862. Perennial herb. SYN. *S. violacea.*

S. purpurea (purple), of gardens. Probably a form of *S. galegifolia.*

S. violacea (violet). A synonym of *S. procumbens.*

SWALLOW-WORT. *See* **Asclepias** and **Chelidonium.**

SWAMMERDAMIA. Now included under *Helichrysum.*

SWAMP DOGWOOD. A common name for **Ptelea trifoliata** (which *see*).

SWAMP HICKORY. A popular name for **Carya amara** (which *see*).

SWAMP ROSE-MALLOW. A common name for *Hibiscus Moscheutos.*

SWAMP SAXIFRAGE. *See* **Saxifraga pennsylvanica.**

SWAMP WHITE OAK. *See* **Quercus bicolor.**

SWAN-NECK, or **SWANWORT.** *See* **Cycnoches.**

SWAN-RIVER DAISY. A common name for **Brachycome** (which *see*).

SWARTZIA (named in honour of Olaf Swartz, M.D., of Stockholm, 1760-1818, a long time resident in the West Indies, author of "Flora Indiæ Occidentalis"). ORD. *Leguminosæ.* A genus comprising nearly sixty species of unarmed, stove trees; one is a native of tropical Africa, and the rest inhabit tropical America. Flowers racemose, or one to a peduncle; calyx firmly closed, but ultimately splitting; corolla sometimes wanting, when present consisting of only one petal (standard), or rarely two or three; stamens indefinite. Pods ovoid or elongated, turgid or sub-terete. Leaves imparipinnate or one-foliolate. Only two species call for description here. They should be grown in a mixture of sandy loam and peat. Cuttings, with the leaves intact, will root in sand, under a glass, in heat.

S. grandiflora (large-flowered). *fl.* yellow, three to five in a corymb, the one petal 1in. or more in diameter. June. *l.*, leaflet single, 3in. to 5in. long, elliptic-oblong, with a bluntish point, glabrous, undulated; petioles short. *h.* 6ft. West Indies, 1821. SYN. *S. simplicifolia.*

S. pinnata (pinnate-leaved). *fl.* yellowish, the one petal roundish, glabrous, half as long again as the calyx; pedicels fascicled; racemes elongated, tomentose-pubescent, longer than the calyx. June. *l.*, leaflets five, 6in. to 12in. long, elliptic-oblong, pointed, glabrous. *h.* 6ft. West Indies, 1817.

S. simplicifolia (simple-leaved). A synonym of *S. grandiflora.*

SWEDISH JUNIPER. *See* **Juniperus communis fastigiata.**

SWEET ACORN OAK. *See* **Quercus Ballota.**

SWEET ALYSSUM. *See* **Kœniga maritima.**

SWEET AMBER. *See* **Hypericum Androsæmum.**

SWEET BASIL. *See* **Basil, Sweet.**

SWEET BAY-TREE. *See* **Laurus nobilis.**

SWEETBRIAR. *See* **Rosa rubiginosa.**

SWEET BROOM. *See* **Scoparia dulcis.**

SWEET CALABASH. *See* **Passiflora maliformis.**

SWEET CASSAVA. *See* **Manihot Aipi.**

SWEET CHESTNUT. *See* **Castanea sativa.**

SWEET CICELY (*Myrrhis odorata*). A hardy perennial, native of Southern Europe, sparingly cultivated for the use of its leaves in salads, &c. It grows almost anywhere, and may be increased by seeds, sown in autumn, or by divisions. The leaves have a strong flavour of aniseed.

SWEET FLAG OR SEDGE. *See* **Acorus Calamus.**

SWEET GALE, or **SWEET WILLOW.** *See* **Myrica Gale.**

SWEET GUM. *See* **Liquidambar styraciflua.**

SWEET LIME. *See* **Citrus Limetta.**

SWEET ORANGE. *See* **Citrus Aurantium.**

SWEET POTATO. *See* **Batatas edulis.**

SWEET SCABIOUS. *See* **Scabiosa atropurpurea.**

SWEET-SCENTED CRAB. *See* **Pyrus coronaria.**

SWEET-SCENTED VERBENA. *See* **Lippia citriodora.**

SWEET SOP. The fruit of **Anona squamosa** (which *see*).

SWEET SULTAN. A common name for several species of *Centaurea.*

SWEET WILLIAM. *See* **Dianthus barbatus.**

SWERTIA (named after Iman. Swert, a famous cultivator of bulbs, &c., in Holland, author of "Florilegium," 1612). Felwort. SYNS. *Agathotes, Henricea, Monobothrium, Ophelia.* ORD. *Gentianeæ.* A genus comprising about forty species of greenhouse or hardy, erect, annual or perennial herbs, inhabiting Europe, Asia, and Africa, mostly in mountainous regions. Flowers blue, rarely yellow, clustered, cymose, or loosely pedicellate, disposed in racemiform, thyrsoid, or loosely corymbose panicles; calyx four or five-parted; corolla rotate, with a very short tube, the lobes twisted to the right; stamens four or five, affixed at the base of the corolla. Leaves opposite, or in the perennial species radical, on long petioles; cauline ones occasionally alternate. The species described below are—with the exception of *S. perennis*—all Indian annuals. Seeds should be sown on a hotbed, and the seedlings, when frosts are well over, transplanted where they are intended to remain. *S. perennis* was once reported as having been found growing wild in Wales, but this has never been confirmed.

S. alata (winged). *fl.* lurid green-yellow, veined with purple, four-parted, in large panicles; corolla lobes often shorter than the calyx. Summer. *l.*, cauline ones sub-sessile, ovate, acute. Stem four-angled, often four-winged. *h.* 1ft. to 2ft. 1868. (B. M. 5687, fig. 12, under name of *Ophelia alata.*)

S. angustifolia (narrow-leaved). *fl.* usually white, dotted with blue or black; sepals often longer than the corolla. Summer. *l.* narrow-lanceolate, narrowed at base. *h.* 1ft. to 2ft. 1868. (B. M. 5687, figs. 3, 4, under name of *Ophelia angustifolia.*)

S. corymbosa (corymbose).* *fl.* pale blue, or white with blue nerves; cymes forming a level-topped corymb. May. *l.*, lower cauline ones ¾in. long, spathulate-obovate, obtuse, slightly petioled; upper ones sessile, ovate or oblong, ½in. long, sub-acute. Stem 8in. to 20in. high, quadrangular or four-winged. 1836. (B. M. 4489, under name of *Ophelia corymbosa.*)

S. paniculata (panicled).* *fl.*, sepals oblong, acute; corolla lobes white above, with two purple or lurid-green marks at base; panicle branched. Summer. *l.* oblong or lanceolate. *h.* 1ft. 1868. (B. M. 5687, figs. 5, 6, under name of *Ophelia paniculata.*)

S. perennis (perennial). Marsh Felwort. *fl.* erect; corolla blue, with dark spots, the segments elliptic-oblong and slightly acute. July. *l.*, lower ones oblong-elliptic, on long petioles; cauline ones opposite, ovate-oblong, somewhat obtuse. Stem ascending, many-flowered. *h.* 9in. Europe. Hardy perennial, requiring a moist, half-boggy position. (F. D. 2047; R. G. 1885, 274.)

Swertia—*continued.*

S. purpurascens (purplish). *fl.* purple or dark red; sepals oblong; corolla lobes ¼in. long, ovate, much reflexed; panicles divaricate, many-flowered, leafy. June. *l.* oblong or lanceolate, 1½in. long, narrowed at base; the lowest ones nearly obtuse, the uppermost ones acute, glabrous. Stems 8in. to 3ft. high. 1840.

S. trichotoma (trichotomous). *fl.* white; corolla lobes often caudate; pedicels ½in. to 1½in. long, numerous, umbelled or clustered at the ends of the cyme branches. Summer. *l.*, upper cauline ones elliptic-lanceolate. *h.* 1ft. to 1½ft. 1863. This is closely allied to *S. corymbosa.* (B. M. 5397, under name of *Ophelia umbellata.*)

SWIETENIA (named in honour of Gerard von Swieten, 1700-1772, a Dutch botanist and author). ORD. *Meliaceæ.* A monotypic genus. The species is a tall, stove tree, with fuscous-red wood—well known as Mahogany, and extensively employed in the manufacture of furniture, &c. *S. Mahagoni* thrives in a compost of loam and sand. It may be increased by ripened cuttings, with the leaves intact, inserted in sand, under a hand-glass, in heat.

S. Mahagoni. Mahogany-tree. *fl.* reddish-yellow, small, in axillary and sub-terminal panicles; calyx five-cleft; petals five, imbricated. May. *l.* abruptly pinnate, highly glabrous; leaflets opposite, petiolulate, oblique, ovate, long-acuminate. *h.* 70ft. Central America and the Antilles, 1734.

SWIFT MOTHS. *See* **Otter Moth.**

SWISS STONE PINE. *See* **Pinus Cembra.**

SWORD LILY. A common name for *Gladiolus.*

SYAGRUS (the old Greek name of a Palm, mentioned by Pliny). ORD. *Palmæ.* A small genus of stove, unarmed Palms, now included, by Bentham and Hooker, under *Cocos.* Flower-spike enveloped in a double spathe. Shell of the fruit hard and bony, having a broad, smooth band or channel running from each of the three pores, and meeting at the top; seed oily, sometimes hollow, inclosed in a hard, bony shell, surrounded by a fibrous rind. Leaves terminal, pinnatisect. For culture, *see* **Cocos.**

S. amara (bitter). *fl.*, inner leaflets of the males linear-oblong; females ovate-globose. *fr.* ovoid-oblong, blunt at both ends, 3in. long. *l.*, segments linear, acuminate. Trunk 60ft. to 100ft. or more in height. Jamaica. In habit this species closely resembles *Cocos nucifera.*

S. botryophora (cluster-bearing). *fl.*, spathe secund, as long as the spadix, sulcate; spadix 1½ft. or more long. *l.* erecto-patent, 9ft. to 10ft. long; pinnæ opposite or grouped, 1½ft. to 2ft. long, linear, acuminate, obliquely adnate, slightly crisped. Trunk straight, 50ft. to 60ft. high, 6in. to 10in. thick. Bahia, 1836. SYN. *Attalea grandis.*

S. campestris (field-loving).* *fl.*, spathe as long as the spadix; spadix 1½ft. long, spreading when flowering, nodding in fruit. *l.* spreading, 2ft. to 6ft. or more long; pinnæ 1½ft. to 2ft. long, not more than ½in. broad; petioles broadly sheathing and very thick, clothed at the edges with woody, brown fibres, and armed with a few stout, dark reddish-brown spines on the naked portion. Trunk swollen at base. Brazil. An elegant and highly ornamental plant.

S. cocoides (Cocos-like).* *fl.* yellowish-white, rather large; outer spathe 1ft. long, obtuse, navicular, ferruginous-tomentose outside, within at first yellowish-white, at length fuscous; inner spathe, together with the compressed-terete peduncle, 1½ft. long; spadix slightly and simply branched, drooping, 1½ft. long, nodding or pendulous, and 2ft. long when fruiting. *l.* all terminal, rather loose, erecto-patent, arcuate, tufted, 4ft. to 6ft. long, pinnate; pinnæ linear, narrow, slightly curled, the adults 9in. to 12in. long, linear-lanceolate, acuminate, highly glabrous. Trunk 8ft. to 10ft. high, 2in. to 3in. thick. Brazil, 1823.

S. comosa (tufted). *fl.*, spathe fusiform, sulcate; spadix 1ft. or more long, with five, six, or numerous flexuous branches. *fr.* fibry, oblong or ovate-oblong, glabrous. *l.* 3ft. to 4ft. long, spreading; pinnæ erect, approximate, lanceolate, obliquely adnate. Trunk 10ft. or rarely more in height, annulate below. Brazil.

S. Mikaniana (Mikan's). *fl.*, spadix 2ft. to 3ft. long. *fr.* about 2in. long. *l.* dense, slightly crisped, 8ft. to 10ft. long; pinnæ linear-lanceolate, acuminate. Trunk 40ft. to 50ft. high, nearly 1ft. thick, irregularly annulate. Brazil, 1853.

S. Sancona (Sancona). *fl.*, outer spathe smaller; inner one fusiform, 3ft. long, opening at back; spadix simply branched; inflorescence monœcious, axillary. *fr.* orange, ovoid, glabrous, smooth. *l.* 8ft. long, reticulate and sheathing at base, spreading; leaflets about 180 on each side, aggregate in threes, fours, or fives, linear, acute, glabrous, papyraceous, 2ft. long, 2in. broad. Trunk 60ft. to 80ft. high, 6in. thick. Brazil.

SYCAMINE-TREE. A Scriptural name for the Mulberry-tree. *See* **Morus.**

SYCAMORE-TREE. *See* **Acer Pseudo-platanus.** The name is also applied to *Platanus occidentalis* and other species.

SYCHINIUM. A synonym of *Dorstenia.*

SYCOMORE FIG-TREE. *See* **Sycomorus antiquorum** (the proper name of which is now *Ficus Sycomorus*).

SYCOMORUS (the old Greek name used by Dioscorides; from *sycos*, a fig, and *moros*, a mulberry). ORD. *Urticaceæ.* A genus comprising nearly a score species of stove or greenhouse trees, confined to the Old World, now included, by the authors of the "Genera Plantarum," under *Ficus.* Male flowers sessile, the perianth three or rarely two-parted; females sessile or pedicellate, the perianth three or many-parted. Leaves alternate, rounded-cordate or oblong, entire or serrated, glabrous, puberulous, or rough. Only a couple of species call for description here. They thrive in sandy loam, with the addition of a little leaf soil, and only small pots, in comparison to the size of plant, need be used. Plenty of syringing, or occasional sponging, will keep the leaves clean, and almost any amount of water may be applied to the roots. The plants are readily propagated by cuttings or eyes, having a leaf attached, inserted in a close frame, inside a propagating house, in early spring.

S. antiquorum (ancients'). Pharaoh's Fig; Sycomore Fig-tree. *fl.* greenish or yellowish, racemose, pedunculate. *l.* ovate, obtuse, cordate at base, four or five-ribbed on both sides, entire, repand, or slightly angular, at length nearly glabrous and smooth; petioles and branchlets slightly hairy. Egypt. SYN. *Ficus Sycomorus.*

S. capensis (Cape). *l.* ovate or ovate-oblong, attenuated and slightly obtuse at apex, rounded or sub-emarginate and entire at base, the rest deeply dentate-serrate, glabrous, smooth, three or four times as long as the petioles. Cape of Good Hope, 1816.

SYKESIA. A synonym of **Gærtnera** (which *see*).

SYLVESTRIS. Growing in woods.

SYMEA. A synonym of **Solaria** (which *see*).

SYMMETRICAL. Regular as to the number of parts or as to shape: *e.g.*, a flower with five sepals, five petals, and five, ten, or fifteen stamens.

SYMPETALOUS. The same as **Monopetalous** (which *see*).

SYMPHACHNE. A synonym of **Eriocaulon** (which *see*).

SYMPHORIA. A synonym of **Symphoricarpus** (which *see*).

SYMPHORICARPUS (from *symphoreo*, to bear together, and *karpos*, fruit; in allusion to the clusters of berries). St. Peter's Wort; Snowberry-tree. SYN. *Symphoria.* ORD. *Caprifoliaceæ.* A genus comprising about half-a-dozen species of handsome, dwarf, hardy, deciduous shrubs, natives of North America and the mountains of Mexico. Flowers white or pink, small, disposed in short, axillary racemes or spikes; calyx tube sub-globose, the limb somewhat irregularly four or five-toothed; corolla funnel-shaped or campanulate, the limb four or five-lobed; stamens four or five. Drupes white or red, baccate, ovoid or globose, fleshy, four-stoned. Leaves opposite, shortly petiolate, ovate, entire or, on young plants, sinuate-toothed. Four of the species have been introduced. They are of very simple culture in

Symphoricarpus—*continued.*

ordinary garden soil, and may be readily increased by suckers, which are thrown up in abundance. The flowers of *S. racemosus* are much sought after by bees; and its fruits form excellent food for game.

S. microphyllus (small-leaved). *fl.* white, axillary, solitary. August. *l.* roundish-ovate, slightly obtuse, pubescent. *h.* 4ft. Mexico, 1829. (B. M. 4975.) SYN. *S. montanus* (B. i. 20).

Symphoricarpus—*continued.*

July to September. *fr.* white, large, persistent through a great part of the winter. *l.* glaucous beneath. *h.* 4ft. to 6ft. North America, 1817. (B. M. 2211 and L. B. C. 230, under name of *Symphoria racemosus.*)

S. r. pauciflorus (few-flowered). *fl.*, spike reduced to one or two flowers in the axils of the uppermost leaves. *l.* about lin. long.

S. vulgaris (common). Coral Berry; Indian Currant; Common

Fig. 557. Upper Portion of Plant of Symphytum asperrimum.

S. montanus (mountain-loving). A synonym of *S. microphyllus.*

S. occidentalis (Western).* Wolf Berry. *fl.* white, tinged with rose-colour, larger and more funnel-shaped than in *S. racemosus*, in dense, terminal and axillary spikes; corolla much bearded within; stamens and style protruded. Summer. *fr.* white. *l.* oval, shortly petiolate, downy beneath, entire, or wavy-toothed or lobed on the young shoots. North America.

S. racemosus (racemose-flowered).* Common Snow Berry. *fl.* rose-coloured, in loose and somewhat leafy, interrupted spikes at the ends of the branches; corolla bearded inside.

St. John's Wort. *fl.* red and yellow, small, in small, close clusters in the axils of all the leaves; corolla sparingly bearded. July to September. *fr.* dark red, the size of hemp-seed. *l.* elliptic-ovate, obtuse, glaucous, pubescent beneath. *h.* 3ft. to 6ft. North America, 1730. In the form *foliis variegatis* the leaves are finely variegated with green and yellow.

SYMPHYANDRA (from *symphio*, to grow together, and *aner*, *andros*, an anther; the anthers are connate). Ord. *Campanulaceæ.* A genus comprising seven species

Symphyandra—*continued.*

of hardy, perennial herbs, natives of the Orient, distinguished from *Campanula* in having connate anthers. Flowers white, yellow (or blue), often nodding, rather large, racemose or loosely paniculate, five-parted; inflorescence centrifugal. Leaves broad, often cordate, toothed; radical ones on long petioles; cauline ones alternate, few or small. Three species have been introduced. A rather rich sandy loam, with plenty of drainage, suits these plants. They are propagated by division of the roots, or by young cuttings, in spring; also by seeds.

S. Armena (Armena). *fl.* blue, terminal, solitary, erect; calyx hoary, with triangular segments; corolla tubular, velvety. June. *l.* ovate, acute, deeply serrated, velvety-hoary. *h.* 2ft. 1836.

S. pendula (pendulous). *fl.* cream-colour, paniculate; calyx lobes lanceolate; corolla funnel-shaped, velvety. July. *l.* ovate, acute, crenate-toothed, velvety. Stem branched, pendulous, somewhat woody, pilose. *h.* 2ft. 1823. (S. B. F. G. ser. ii. 66.)

S. Wanneri (Wanner's).* *fl.* blue; calyx lobes acuminate, one-half shorter than the tubular-campanulate corolla; peduncles one-flowered, axillary and terminal. Summer. *l.* lanceolate, unequally toothed, villous-pubescent, the lower ones petiolate. Stems erect, 6in. high, terete, striated, pubescent. Alps. SYN. *Campanula Wanneri.*

SYMPHYOGLOSSUM. A synonym of **Cynanchum** (which *see*).

SYMPHYOSTEMON (from *symphyo*, to unite, and *stemon*, a stamen; the filaments are connate at base, in a cylindrical tube). SYNS. *Psithyrisma, Susarium.* ORD. *Irideæ.* A small genus (two or three species) of greenhouse or half-hardy plants, with fibrous roots, natives of extra-tropical South America or the Andes. Flowers several in a spathe, pedicellate; perianth yellow, whitish, or purple-striped, the tube rather long, funnel-shaped, the lobes sub-equal and erecto-patent; stamens affixed to the throat; scape sometimes very short, sometimes very tall and leafless, or with one floral leaf. Leaves radical, linear, clustered. *S. narcissoides*, the only species introduced, thrives in a compost of sandy loam and leaf mould. Propagation may be effected by seeds, or by offsets, in spring.

S. narcissoides (Narcissus-like). *fl.* dirty-white, veined with brownish-purple, very fragrant, nodding, on short stalks, funnel-shaped; spathe consisting of bracts, membranous at the margin, of which the lowermost is sharper than the others. June. *l.* very narrow, glaucous, subulate at apex. Stem 1ft. to 1½ft. high. South coasts of South America, 1828. SYN. *Sisyrinchium odoratissimum* (B. R. 1283).

SYMPHYOSTEMONOUS. With united stamens.

SYMPHYSIS. A term signifying a growing together.

SYMPHYTUM (the old Greek name used by Dioscorides, and derived from *symphuo*, I make to grow together; from its supposed power of healing wounds). Comfrey. ORD. *Boragineæ.* A genus comprising about seventeen species of hardy, erect, sometimes tuberous herbs, natives of Europe, North Africa, and Western Asia. Flowers yellowish, blue, or purplish, pedicellate, cymose or racemose; calyx five-cleft or five-parted, the segments linear; corolla broadly tubular, enlarged above, with five scales in the throat; lobes five, very short, erect and tooth-like or scarcely spreading; stamens five, affixed to the middle of the tube. Nutlets four, ovoid, smooth. Leaves alternate or mostly radical; cauline ones sometimes decurrent; uppermost ones sometimes closely approximate and nearly opposite. *S. officinale* is a well-known plant which has become rather widely naturalised along our water-courses; it has much the taste and properties of Borage. The species described below are showy subjects,

Symphytum—*continued.*

thriving in almost any soil or situation. They succeed under the shade of trees, and flower throughout the principal part of the summer. Propagation may be effected by divisions.

S. asperrimum (very rough). Prickly Comfrey; Trottles. *fl.* bluish-purple; corolla campanulate, four times as long as the calyx. *l.* ovate-lanceolate, very acute at both ends, scabrid; lower ones petiolate; uppermost ones sub-sessile. Stem branched, strigosely bristly. *h.* 4ft. Caucasus, 1799. See Fig. 557. The variety *aureo-variegatum* has the leaves bordered with yellow.

S. bohemicum (Bohemian). A synonym of *S. officinale bohemicum.*

S. caucasicum (Caucasian).* *fl.* blue; corolla sometimes thrice as long as the obtusely five-toothed calyx, the limb campanulate. *l.* ovate-lanceolate, hairy; lower ones attenuated into long petioles; upper ones nearly opposite, shortly decurrent at the sides of the stem. *h.* 3ft. Caucasus, 1820. (B. M. 3188.)

S. Donii (Don's). *fl.* blue; calyx lobes subulate, scabrid; corolla tube equalling the calyx, the limb campanulate, with linear, obtuse appendages. *l.* scabrid; lower ones ovate-lanceolate, attenuated into the petioles; upper ones lanceolate, narrow, decurrent at the sides of the stem. *h.* 2ft. (S. B. F. G. ser. ii. 294, under name of *S. caucasicum.*)

S. officinale (officinal). Alum; Black Root; Common Comfrey; Knitback, &c. *fl.* creamy-yellow, drooping, in scorpioid cymes; calyx lobes narrow-lanceolate; corolla ⅔in. long. *l.* ovate-lanceolate; radical ones 4in. to 8in. long, on long, winged petioles; cauline ones shortly petiolate. Stem 1ft. to 3ft. high, branched. Europe (Britain), &c. (Sy. En. B. 1115.)

S. o. bohemicum (Bohemian).* *fl.* red or reddish-purple; racemes twin, erect, revolute at apex. *l.* running into the petioles. Bohemia, 1810. (S. B. F. G. ser. ii. 304.) SYN. *S. bohemicum.*

FIG. 558. SYMPHYTUM OFFICINALE LUTEO-MARGINATUM.

S. o. luteo-marginatum (yellow-margined). A variety having the leaves margined with yellow. 1870. See Fig. 558. SYN. *S. o. variegatum.*

S. o. patens (spreading). A purple-flowered form. (Sy. En. B. 1116.)

S. o. variegatum (variegated). A synonym of *S. o. luteo-marginatum.*

S. orientale (Oriental). *fl.* whitish; corolla twice as long as the five-toothed calyx, funnel-shaped above, with linear-attenuated appendages. *l.* oblong-ovate, acute, narrowed at base; lower ones alternate, petiolate, sub-cordate; uppermost ones nearly opposite, sessile. Stem branched. *h.* 3ft. Orient, 1752. Plant clustered, pubescent.

S. o. angustior (narrowed). *l.* oblong- or oval-lanceolate, undulated. (B. M. 1912, under name of *S. orientale.*)

S. peregrinum (foreign). *fl.* reddish and purplish; calyx five-parted nearly to the base, the segments acuminate; corolla three or four times longer than the calyx, sub-campanulate above the middle, shortly five-cleft. *l.*, lower ones on long petioles, elliptic-lanceolate, acuminate; upper ones sessile. Stem tall, branched. Iberia, &c., 1816. See Fig. 559. (B. M. 6466.) This species is largely cultivated as a fodder plant, under the erroneous name of *S. asperrimum.* By some authors it is regarded as a hybrid between *S. asperrimum* and *S. officinale.*

Symphytum—*continued.*

S. tauricum (Taurian). *fl.* whitish; calyx acutely lobed above the middle; corolla twice as long as the calyx, with obtuse lobes and linear appendages. *l.* acute, slightly undulated; lower ones alternate, petiolate, ovate-cordate; uppermost ones opposite, sessile. Stem branched. *h.* 3ft. Tauria, 1806. Plant pilose, hairy. (B. M. 1787.)

FIG. 559. INFLORESCENCE OF SYMPHYTUM PEREGRINUM.

S. tuberosum (tuberous-rooted).* *fl.* ochreous. *l.* scarcely decurrent; radical ones on long petioles. Stem 1ft. to 2ft. high. Rootstock short, horizontal. Europe (Britain). This resembles *S. officinale*, but the flowers are smaller, and the radical leaves are on longer petioles. (J. F. A. 225; Sy. En. B. 1117.)

SYMPIEZA (from *sympiezo*, to press; in reference to the stamens, which adhere to the corolla tube). ORD. *Ericaceæ*. A small genus (five species) of small, Heath-like, greenhouse shrubs, confined to South Africa. Flowers small, clustered in terminal heads, ebracteate or tribracteate; calyx rather thick, complanate and bilabiate or tubular-campanulate and four-toothed; corolla marcescent, oblique or curved, with a shortly-bifid limb, the lobes broad and connivent; stamens four, exserted. Leaves ternately whorled, small or minute, linear or elliptic, sulcate at back. *S. capitellata*, the only species introduced to our gardens, is a pretty little shrub, thriving in a compost of turfy peat and sand. It may be increased by young cuttings, inserted in sand, under a glass.

S. capitellata (small-headed). *fl.* pink, in sub-globose, drooping heads; corolla thrice as long as the shortly-ciliated, compressed, bilobed calyx. July. *l.* linear-trigonal or erecto-incurved; floral ones scarcely longer than the calyx. *h.* 1½ft. 1812.

SYMPLOCARPUS (from *symploke*, connection, and *karpos*, fruit; alluding to the coalescence of the ovaries into a compound fruit). SYNS. *Ictodes*, *Spathyema*. ORD. *Aroideæ* (*Araceæ*). A monotypic genus. The species is a large, robust, hardy, aquatic perennial, having a similar fœtid odour to that of the skunk. It succeeds in a marshy situation, preferring peat soil. Increased by divisions.

S. fœtidus (fœtid). Meadow or Skunk Cabbage, &c. *fl.* all fertile; spathe spotted and striped with purple and yellowish-green, ventricose or conchoid, curved at apex, thickly coriaceous, persistent; spadix violet, included, globular, short-stalked, entirely covered with thickly-crowded flowers; peduncle very short. May. *l.* 1ft. to 2ft. long, ample, ovate-cordate, acute, thickly coriaceous, with thick nerves; petioles short, robust, long-sheathing. Rootstock descending. *h.* 1ft. America, North-eastern Asia, and Japan. (B. M. 3224.) SYN. *Pothos fœtidus* (B. M. 836).

SYMPLOCOS (from *symploke*, a connection; the stamens are united at the base). Including *Hopea*. ORD. *Styraceæ*. A large genus (about 150 species) of stove or greenhouse, usually glabrous, rarely pubescent or villous, trees and shrubs, broadly dispersed over the warmer parts of Asia, Australia, and America. Calyx five-lobed, imbricated; corolla lobes or segments five and one-seriate, or six to ten and biseriate, free or more or less connate; stamens often numerous, many-seriate; racemes or spikes axillary, loose or dense, sometimes reduced to few-flowered fascicles or even to single flowers. Leaves alternate, coriaceous or membranous. The five species introduced thrive in a compost of loam, peat, and sand. Propagation may be effected by cuttings, inserted in sand, under a glass (those of *S. coccinea* and *S. Sumuntia* in heat).

S. coccinea (scarlet). *fl.* red, axillary, solitary, sessile, 1in. broad; corolla ten-lobed, spreading; petals nearly connate at base. May. *l.* elliptic-oblong, 3in. to 4in. long, acuminate, obtuse at base, crenulated, glabrous above, pilose beneath; petioles ⅓in. long. *h.* 10ft. Mexico, 1825. Stove tree.

S. cratægoides (Cratægus-like). *fl.* white, small; panicles 1in. to 5in. long, cymosely many-flowered. April. *l.* 2½in. by 1in. to 1½in., varying from lanceolate and acuminate to broadly obovate-elliptic and nearly obtuse, closely serrated towards the apex. *h.* 3ft. to 40ft. Himalaya and Japan, 1824. Greenhouse shrub or tree.

S. japonica (Japanese). *fl.* pale yellow, sub-sessile; racemes axillary, simple, shorter than the petioles, three to five-flowered. June. *l.* oblong- or obovate-elliptic, 2in. long, acute at both ends, glabrous, serrated; petioles ⅓in. long. *h.* 10ft. Japan, 1850. Greenhouse tree. (S. Z. F. J. 24, under name of *S. lucida*.)

S. sinica (Chinese). *fl.* white, fragrant; racemes compound, terminal and axillary, as long as the leaves. May. *l.* elliptic, 1½in. to 2in. long, acute at both ends, serrated, and, as well as the branches and branchlets, pubescent. *h.* 3ft. China, 1822. Greenhouse shrub. (B. R. 710.)

S. Sumuntia (Sumuntia). *fl.* whitish, small, produced in short, few-flowered spikes. Summer. *l.* narrowly elliptic, acute, serrulate, cuneate at base. Himalaya, 1883. An unattractive, stove shrub. (R. G. 1073, fig. c-g.)

S. tinctoria (dyer's). Horse Sugar; Sweet Leaf. *fl.* yellow, odorous, six to fourteen in close and bracted clusters. April. *l.* elongated-oblong, 3in. to 5in. long, acute, obscurely toothed, thickish, almost persistent, minutely pubescent and pale beneath. *h.* 3ft. South United States, 1780. Greenhouse shrub. The leaves are sweet, and are greedily eaten by cattle; after drying, they are used for dyeing yellow.

SYMPODE, SYMPODIUM. "A stem made up of a series of superposed branches in a way to imitate a simple axis; a Sympodial stem" (Asa Gray).

SYN. A term which, in Greek compounds, signifies union, adhesion, or growing together: *e.g.*, Synantherous, stamens coalescent by their anthers; Syncarpous, composed of two or more united carpels.

SYNADENIUM (from *syn*, united, and *aden*, a gland; the glands of the involucre are united in a cup or disk). African Milk-bush. ORD. *Euphorbiaceæ*. A small genus (two or three species) of slightly fleshy, terete-branched, stove shrubs, natives of South and tropical East Africa. Flowers rather inconspicuous, in terminal, loosely corymbose, bi- or trichotomously-branched, cymes; involucre campanulate, regular, five-lobed, five-glanded, seated on a flat-concave cupule; males (on separate cymes) from twenty to thirty in five fascicles; females

Synadenium—*continued.*

solitary, with bifid, recurved stigmas. Leaves scattered, obovate, entire, rather thick. Only one species has been introduced. It thrives in a thoroughly well-drained, sandy loam, with the addition of a little well-rotted cow-dung. Propagation may be effected by cuttings, thoroughly dried at the base, inserted in sand, and occasionally very slightly moistened.

S. Grantii (Captain Grant's). *fl.* red-purple; involucre ¼in. in diameter; pedicels purplish; cymes axillary, corymbosely branched, 6in. to 8in. long, green; bracts appressed. November. *l.* 3in. to 4in. long, obtuse, not very succulent, dark green above, paler below. Stem stout, terete. *h.* 6ft. to 10ft. Central Africa, 1867. (B. M. 5633.)

SYNANDRA (from *syn*, together, and *aner, andros*, an anther; the posterior and sterile anthers are connate). ORD. *Labiatæ*. A monotypic genus. The species is a hardy, hairy, fibrous-rooted biennial, with the habit of *Lamium*, and requiring ordinary culture.

S. grandiflora (large-flowered). *fl.* white or nearly so, solitary in the bracts; corolla 1½in. long; filaments bearded. June. *l.* membranous, cordate, coarsely crenate, all but the floral ones (which are reduced to ovate, sessile bracts) long-petioled. *h.* 1ft. to 2ft. North America, 1827.

SYNANDRA (of Schrader). A synonym of *Aphelandra*.

SYNANTHEREÆ. Synonymous with *Compositæ*.

SYNAPHLEBIUM. Included under *Davallia* and *Lindsaya*.

SYNARRHENA. A synonym of **Mimusops** (which *see*).

SYNCARPIUM. A multiple fruit, as the Mulberry; or a fleshy, aggregate fruit, like that of *Magnolia*.

SYNECHANTHUS (from *syneches*, continuous, and *anthos*, a flower; in allusion to the arrangement of the inflorescence). SYNS. *Rathea, Reineckia*. ORD. *Palmæ*. A small genus, consisting of two Central American and one Columbian species of gregarious, unarmed, stove Palms. Flowers greenish or the males purplish, minute; spathes many, tubular, membranous, persistent; spadices many, on long and slender peduncles, erect in flowering, with straight, compressed or ancipitous branches. Fruit reddish-yellow, shining, ellipsoid, one-seeded. Leaves terminal, equally pinnatisect; segments broad or narrow, membranous, acuminate, plicate-nerved, often interrupted, the margins recurved at base; rachis convex at back, deeply keeled above; petioles channelled above; sheaths short, opening. Trunk slender, annulate, often stoloniferous. *S. fibrosus*, the only species introduced, is an exceedingly graceful Palm, requiring similar treatment to **Chamædorea** (which *see*).

S. fibrosus (fibrous-rooted).* *fl.* in two-ranked, short, linear clusters; spathes several; spadices one-third as long as the leaves, the branches many, very slender, forked. *fr.* orange-red, sessile, 1in. to 1¼in. long. *l.* 4ft. long, erect and spreading; leaflets numerous, 1ft. to 1½ft. long, spreading and rather pendulous, linear-lanceolate. Trunk 4ft. high, green. Central America. (B. M. 6572.)

SYNEDRAL. Growing on the angles of a stem.

SYNGENESIA. A Linnean class, characterised by having Syngenesious anthers.

SYNGENESIOUS. Having the anthers united at their edges, so as to form a tube.

SYNGONIUM (from *syn*, confluent, and *gone*, the womb; alluding to the cohesion of the ovaries). ORD. *Aroideæ* (*Araceæ*). A genus comprising about eight species of stove, climbing shrubs, natives of tropical America. Flowers monœcious, the males and females remote; spathe tube ovoid, accrescent, persistent, the throat contracted, the lamina boat-shaped, at length deciduous; spadix inappendiculate, much shorter than the

Syngonium—*continued.*

spathe; peduncles fascicled or solitary, short. Leaves petiolate; primary ones sagittate; adults pedately three to nine-cut; petioles elongated; sheaths persistent, accrescent. The species introduced are described below. They are easily grown in a house where a high temperature and a moist atmosphere are maintained. An open compost of loam and peat, or leaf mould, to which some coarse sand should be added, is best; the plants are not, however, very fastidious regarding soil. Plenty of water and frequent syringings are essential in the summer or growing season; and no more shade should be applied than is requisite to keep the leaves from scorching. Propagated easily by dividing the stems into lengths consisting of about three joints, and inserting them in pots, in a brisk heat. These soon become established, and make new growth at the top. Any old plants which get too high for the house they occupy may have their tops cut off and inserted as large cuttings: these soon re-establish themselves.

S. affine (related). *fl.*, spathe green, the lamina yellowish within; peduncles very numerous, two to seven from one axil, slender, nearly equalling the spathe. *l.* acute; anterior lobes oblong-triangular; posterior ones trisected, sub-auriculate or auriculate; petioles twice or thrice as long as the leaves, sheathed above the middle. Brazil. SYN. *S. gracile*.

S. auritum (eared). Five Fingers. *fl.*, spathe tube purplish, cylindrical, the lamina ovate-oblong, shortly cuspidate, purplish at throat, the rest yellow; peduncles short. *l.* three or nearly five-cut; middle segment largest, broadly ovate-oblong, rounded and shortly cuneate towards the base; lateral segments inequilateral, falcate-oblong, auriculate. Branches green. Jamaica.

S. gracile (slender). A synonym of *S. affine*.

S. podophyllum albo-lineatum (foot-leaved, white-lined). *fl.*, spathe tube oblong-ovoid, the lamina cuspidulate; peduncles many. *l.* at first sagittate; adults consisting of five to seven distant, oblong-lanceolate, acute segments; midrib and lateral nerves whitish; petioles elongated. Central America. SYN. *S. Seemanni*.

S. Seemanni (Seemann's). A synonym of *S. podophyllum albo-lineatum*.

S. Vellozianum (Velloz'). *fl.*, spathe tube green, ovate, acuminate, the limb pale yellowish-green outside, whitish green within; peduncles many, rather long, slender. *l.* at first rather broadly sagittate; petioles scarcely longer than the blade, sheathed above the middle. Young branches slender. Rio de Janeiro. *S. Reidelianum* is a form of this species with an oblong spathe tube, and shorter peduncles.

S. Wendlandii (Wendland's). *fl.*, spathe tube rather shorter than the oblong-lanceolate, cuspidate-acuminate lamina; spadix one-sixth shorter than the spathe; peduncle equalling the spathe tube. *l.* rather longer than the petioles, trisected, the segments oblong-lanceolate; young leaves sagittate. Caudex ascending; internodes green. Costa Rica.

SYNGRAMME. Included under *Gymnogramme*.

SYNNETIA. *See* **Synnotia.**

SYNNOTIA (named in honour of W. Synnot, who collected many plants at the Cape of Good Hope). Erroneously spelt *Synnetia*. ORD. *Irideæ*. A small genus (three species) of pretty, greenhouse, bulbous plants, natives of South Africa. Flowers rather large, sessile; perianth funnel-shaped, with erecto-patent, unequal lobes; stamens affixed at base of throat; spathes scattered at the sides of the stem, rather broad, cut or fimbriate-toothed at apex, one-flowered. Leaves few, flat, linear-ensiform, flaccid. Stem simple or very slightly branched. Propagation is readily effected by seeds; or by offsets, which are freely produced. Seeds should be sown in pans of sandy soil, about September, and placed in a cool frame. The young plants may remain in the seed-pans for the first year, when they should be either potted singly or planted out. Three or four years elapse before they flower. Propagation by offsets is a much quicker method, as the plants then generally flower the second year. Synnotias, cultivated as pot plants, are adapted for conservatory and cool greenhouse decoration, in spring. The bulbs should be potted rather firmly, in sandy loam and leaf soil, during October, placing about six or eight in a 5in. pot, and covering

Synnotia—*continued.*

them with 1in. of soil. The pots may then be plunged or stood on ashes in a cool frame, and but little water will be required throughout the winter. When the flowers appear, more water may be given, and the plants fully exposed to light and plenty of air: draughts, however, must be avoided. After flowering, growth and a gradual ripening should be encouraged, by keeping the plants watered for a time. When the leaves die away, the bulbs may be shaken out and stored in bags until the autumn, or they may be allowed to remain in the soil and be kept dry.

S. bicolor (two-coloured). *fl.* alternate, distant; perianth violet and yellow, the tube curved, the segments ovate; spathe $\frac{2}{3}$in. long; scape erect, 6in. to 10in. high, simple or branched, leafy. March. *l.* distichous, striated, acute, $\frac{2}{3}$in. broad. 1786. (B. H. ii. 25; B. M. 548, under name of *Ixia bicolor.*)

S. galeata (helmeted). *fl.*, perianth ringent, the three lower segments yellowish, the others white tinged with red. *l.* ovate-ensiform.

FIG. 560. FLOWERING BRANCH OF LILAC CHARLES X.

S. variegata (variegated).* *fl.* alternate, distant; perianth yellow and violet, the tube elongated, 1$\frac{1}{2}$in. long, the uppermost segment erect, the two lateral ones recurved; scape terete, simple, 1$\frac{1}{2}$ft. high. May. *l.* ovate-lanceolate-ensiform, the lower ones distichous, the upper ones alternate. 1825. (S. B. F. G. 150.)

SYNONYM. In botany, a superseded or unused name.

SYNSEPALOUS. The same as **Gamosepalous** (which *see*).

SYRINGA (from *syrin*, *syringos*, a pipe; the branches are long and straight, and are filled with medulla). Lilac; Pipe-tree. Including *Ligustrina*. ORD. *Oleaceæ*. A well-known genus, comprising about ten species of ornamental, hardy, deciduous, glabrous or pubescent shrubs, natives of Eastern Europe and temperate Asia. Flowers disposed in terminal, thyrsoid or trichotomous panicles, the inflorescence at first centripetal, ultimately often centrifugal; calyx campanulate, irregularly toothed; corolla tube cylindrical, rarely shortened; lobes four, shorter or longer than the tube, induplicate-valvate; stamens two, affixed nearly at the apex of the tube, the filaments short or filiform. Leaves opposite, entire or rarely pinnatisect. Nearly all the species, and many splendid varieties, have been introduced to our gardens. The common English name is said to have been derived from *Lilac* or *Lilag*, the Persian word for the flowers. The common Lilac, *S. vulgaris*, and its varieties, are the largest in the genus, and are also among the commonest and most beautiful of our spring-flowering shrubs.

Propagation. Lilacs may be readily increased by suckers, which are produced in abundance from the roots. Scarce or good varieties may be increased by means of shield-budding, using a pushing bud in April, or a dormant one in July. Crown-grafting or cleft-grafting in March is also practicable, either on stocks near the ground, or on others prepared as dwarf or tall standards. Seedling plants should be raised for stocks, as they are less likely to produce suckers, which would, in due course, deprive the bud or graft of its full amount of nutriment. Strong-growing varieties are usually worked near the ground, and the new shoot allowed to run up; others, of slender growth, are best united higher up on a more vigorous stock. The varieties may also be raised from cuttings.

Cultivation. Few shrubs are more universally grown and admired when in flower than the species and varieties of *Syringa*. They grow freely, and flower profusely outside in almost any soil and situation, but well repay any extra attention bestowed in removing suckers or giving a little good soil occasionally. They are also amongst the best of subjects for forcing in winter and early spring. One of the finest varieties for this latter purpose is Charles X. (see Fig. 560): its panicles of flowers are much larger and more compact than the so-called Persian Lilac of gardens (*S. chinensis*), which is, however, well adapted for treating in a similar way. In France, Lilacs are extensively forced in places where light is excluded. The flowers thus become, by blanching, pure white, and are in great request in the flower market for making bouquets, &c.; large quantities being sent annually to England, amongst other places. The common Lilac (*S. vulgaris*) is also amenable to blanching. It has been recently discovered that, if forced in a sufficiently heated structure, the colouring matter has no time to form in the flowers, and therefore the same results are obtained as if the plant were, according to the old recognised method, grown in a place where light was excluded.

Lilac flowers, when blanched pure white, have a very chaste and beautiful appearance. The process of blanching is best performed in a cellar or shed, from which all light can be excluded. A temperature of 55deg. or 60deg., with a moist atmosphere, should be maintained, and it should preferably be secured by fermenting material composed of stable litter and leaves. One disadvantage connected with blanching is the impossibility of obtaining any foliage to accompany the flowers. Leaves procured from other plants exposed to light may, however, be substituted.

Forcing. Lilac plants intended for forcing are best prepared by being grown purposely in pots; at any rate, they should be lifted and potted early in autumn, using any ordinary loamy soil, and afterwards standing

Syringa—*continued.*

them outside until required. Only those with plenty of flower-buds should be selected for forcing. The difference in flower and wood-buds is not always readily seen, as both are on the points of the shoots. Flower-buds are globose, and much more plump than the others, and may thus be distinguished. Light protecting material should be placed round the pots for the winter, and a few plants, as may be required, introduced to the forcing house at intervals of two or three weeks from November onwards. A moist temperature of 55deg. will be sufficient at first, as it is important that the flowers should be induced to start a little in advance of the leaves. When Lilacs are placed direct into a high temperature, growth is unduly excited, and the flowers often remain dormant, and eventually die away instead of opening. When flowering is over, the growths may be cut back to within 2in. of the starting point of the previous year. Lilacs do not answer well for forcing two years in succession; consequently, two

FIG. 561. FLOWERING BRANCH OF SYRINGA CHINENSIS.

batches should be kept, one to remain in the ground outside while the other is being forced. Where expense is not an object, beautiful plants may be purchased annually. They are imported from the Continent in large quantities, both as dwarfs and standards, and are all invariably well set with flower buds.

Fungi. Few Fungi ever do conspicuous harm to plants of this genus, and none are known to be really dangerous to their welfare. The only ones that call for even a passing reference are those that grow on the living leaves. These organs are occasionally more or less covered with a diffused white coat of hyphæ of **Oidium** (which *see* for remedies). Other plants show a dark coating of *Fumago vagans*, so widely diffused on almost all shrubby plants, especially when growing under trees infested by Aphides. Well syringing the leaves with clean water, or with soapsuds, will remove honey-dew, which serves as the food of the Fungus, and will also clear away the Fungus itself. In the North of

Syringa—*continued.*

Scotland, the leaves of Lilacs often show brown patches, with a green, watery border. These patches are the work of a Fungus, discovered by Mr. A. S. Wilson, and named by Mr. Berkeley *Ovularia Syringæ* (G. C., 19th Oct., 1881). Hyphæ are pushed out through the stomata of the leaves, and each bears on the tip a pear-shaped spore, fixed by the broader end. Mr. W. G. Smith has described the sexual spores of this Fungus. They are formed on the decaying, fallen leaves. The best remedy is to gather and burn such leaves in autumn. The leaves of Lilacs are apt to be disfigured by dry spots, the work of various Fungi, *e.g.*, *Asteroma vagans*, *Cercospora Lilacis*, *Phyllosticta Syringæ*, *Septoria*

FIG. 562. FLOWERING BRANCH OF SYRINGA EMODI.

Syringæ, &c.; but it would be useless to enter into a description of these so-called species, as they are only stages in the development of others, probably *Pyrenomycetes*, not yet ascertained; and the effects are much alike with all of them. A few of these have not yet been recorded as British. The Lilacs seem little the worse for their presence. Probably, burning the fallen leaves would be found sufficient to prevent the disfigurement from spreading.

Insects. Insect pests are not dangerous. They are chiefly the larvæ of a few Moths; *e.g.*, the Privet Hawk-moth (*see* **Sphingidæ**), one or two *Noctuæ* and Geometers, and one of the *Tineina*, named *Gracilaria syringella*. The last-mentioned causes the most conspicuous damage, as it

Syringa—*continued.*

is very common. Its larva burrows in the leaves, and forms an irregular mine, ending in a pale blotch. After a time, it leaves the mine, and rolls up the leaf into a tube for its own protection, till full-fed, when it drops to the soil, and becomes a pupa below ground. The moth is about ½in. in spread of wings: these are yellowish-white, with a basal patch, a blotch on the inner margin, and three oblique bars (all brown). The leaves should be picked off while the larvæ are in them, and may be crushed or burned. The larvæ of the other Moths are all much larger than the *Gracilaria*. They may be exterminated by shaking the bushes over anything placed below, to receive the insects as they fall.

FIG. 563. FLOWERING BRANCH AND LEAF OF SYRINGA JAPONICA.

S. amurensis (Amur). A synonym of *S. japonica*.

S. chinensis (Chinese). Rouen Lilac. *fl.* of an intense violet colour; corolla limb flat. May and June. *l.*, including the petioles, six to seven lines long, ovate-lanceolate, slightly acute at the base, acuminate at apex, highly glabrous. *h.* 4ft. 1795. This plant varies somewhat in the colour of its flowers. It is regarded by some authors as a hybrid between *S. persica* and *S. vulgaris*. See Fig. 561. SYNS. *S. dubia*, *S. rothomagensis*.

S. dubia (doubtful). "Persian Lilac." Erroneously called *S. persica* in gardens. A synonym of *S. chinensis*.

S. Emodi (Mount Emodus).* *fl.* purplish or white, often fascicled; corolla tube ⅓in. long, lobes ⅙in. long; panicles dense-flowered. April. *l.* 3½in. long, 1¾in. broad, elliptic or ovate, acute at both ends, glabrous; secondary nerves prominently reticulated beneath; petioles ½in. to ¾in. long. *h.* 6ft. Himalayas, 1840. See Fig. 562. (B. R. xxxi. 6.)

S. E. variegata (variegated). This differs from the type in having the leaves blotched with dull yellow.

S. japonica (Japanese). *fl.* creamy-white, in a dense-flowered thyrse. Summer. *l.* broad-ovate, acuminate, with a rounded or sub-cuneate base, glabrate above; midrib and veins pubescent beneath. Japan, &c. A handsome shrub. See Fig. 563. (G. C. n. s., xxv. 561.) SYNS. *S. amurensis*, *Ligustrina amurensis*.

S. Josikæa (Countess von Josika's).* *fl.* bluish-purple, scentless; corolla limb slightly concave; pedicel not exceeding the calyx. May. *l.* elliptic-lanceolate, acute, wrinkled, slightly ciliated, glabrous, intense green and shining above, whitish beneath; petioles of the upper leaves two to three lines long. *h.* 5ft. to 10ft. Hungary, 1835. (B. 24; B. M. 3278; B. R. 1733.)

S. oblata (oblate). *fl.* purple, profusely produced in very ornamental bunches; cup of the calyx more acutely four-toothed than in the common Lilac. May. *l.* very striking, large, rather fleshy, oblately cordate. China, 1859. About the size of the English Lilac, but more tree-like in general outline. There is a white-flowered variety.

S. persica (Persian). *fl.* bluish-purple or white, the limb rather flat. May and June. *l.* lanceolate, acute, highly glabrous, sometimes parted or pinnatifid. *h.* 4ft. to 5ft. Persia, 1640. The smallest species of the genus.

S. p. integrifolia (entire-leaved). *l.* all undivided. (B. M. 486, under name of *S. persica*.)

FIG. 564. BRANCH, IN FRUIT, OF SYRINGA PERSICA LACINIATA.

S. p. laciniata (torn). *l.* all, or nearly all, inciso-pinnatifid. See Fig. 564. (L. B. C. 1107.)

S. rothomagensis (Rouen). A synonym of *S. dubia*.

S. villosa (villous). *fl.* bluish-purple; corolla-tube slender, the limb with oblong, reflexed lobes. May. *l.* ovate or ovate-elliptic,

Syringa—*continued.*

rather obtuse, glabrous above, pilose on the principal nerves beneath. *h.* 3ft. to 6ft. North China, 1880.

S. vulgaris (common).* Common Lilac; Pipe-tree. *fl.* red, blue, or white; corolla limb slightly concave. May. *l.* cordate or ovate-cordate, highly glabrous. *h.* 8ft. to 20ft. or more. Persia, Hungary, &c., 1597. Many beautiful varieties, of which the following are a selection, are referred to this species.

S. v. alba (white).* *fl.* white; thyrse ample, clustered. Branches and buds greenish. *h.* 12ft. to 15ft. There are two sub-varieties: *major*, with larger, and *plena*, with double, flowers.

S. v. cærulea (blue). *fl.* slightly rosy, at length becoming blue; thyrse sparingly clustered. *h.* 12ft. A sub-variety has the leaves imperfectly variegated.

S. v. grandiflora (large-flowered). *fl.* red, large.

S. v. purpurea (purple). *fl.* violet-purple; thyrse ample, crowded. Branches and buds purplish.

S. v. violacea (violet). Scotch Lilac. *fl.* of a beautiful violet or lilac; thyrse sparingly clustered. Branches and buds purplish. *h.* 10ft. (B. M. 183.)

GARDEN VARIETIES. A select list of garden varieties is given below:

ALBA GRANDIFLORA, flowers white, large, one of the best; ALBA MAGNA, one of the finest whites; ALBA VIRGINALIS, flowers snowy-white, trusses large, good for forcing; ALPHONSE LAVALLEE, flowers sky-blue, shaded with violet, double, in very large trusses; CHARLES X., flowers deep purplish-lilac when grown outside, white when forced, very large trusses, extra fine, one of the best for forcing; DR. LINDLEY, flowers reddish-lilac, in extremely large clusters; LE GAULOIS, flowers dark peach-colour, with light centres, very double, in large, close trusses; LEMOINEI, flowers pale ashy-lilac, double; MATHIEU DE DOMBASLE, flowers reddish-mauve, double, trusses nearly 1ft. long; MICHEL BUCHNER, flowers pale lilac, rose-margined, double, in fine, erect, pyramidal trusses; RANUNCULIFLORA, flowers dark red, becoming lilac, double; RENONCULE, flowers azure-mauve, strongly perfumed, double, very full; RUBELLA PLENA, flowers vinous-red, changing to rosy-violet, double.

SYRINGA, MOCK. A common name for **Philadelphus coronarius** (which *see*).

SYRINGODEA (from *syriggodes*, fistular; in reference to the slender perianth tube). ORD. *Irideæ*. A small, South African genus (three species) of pretty, dwarf, greenhouse herbs. Flower solitary in the spathe, sub-sessile or shortly pedicellate; perianth salver or funnel-shaped, with a long and very slender tube and sub-equal, spreading lobes; stamens affixed to the throat; spathes sub-sessile within the leaves, narrow, hyaline. Leaves filiform. Only the typical species, *S. pulchella*, has been introduced. For culture, *see* **Ixia**.

S. pulchella (rather pretty). *fl.*, perianth tube cylindrical, 1½in. to 2in. long, thickened above; limb pale purple, the segments

Syringodea—*continued.*

obovate-cuneate, deeply emarginate; spathe valves lanceolate, ½in. to ¾in. long. Autumn. *l.* four to six, setaceous, falcate, glabrous, 3in. to 4in. long. Bulb globose, thick, one-flowered. South Africa, 1873. A very pretty plant. (B. M. 6072; F. d. S. 2096.)

SYRINGODEA (of Don). Included under *Erica*.

SYRPHUS. A genus of two-winged flies (*Diptera*) popularly known as "Hawkflies," because of their rapid, darting flight. They are partial to settling on flowers; and most of them are conspicuous because of the bright spots of yellow, and the metallic greens and other hues, that they bear. They mostly vary in size between a common Housefly and a Bluebottle Fly; and some of them are a good deal the same shape as the latter insect. Hawkflies are mostly smooth-bodied; but, in several genera allied closely to *Syrphus* (*e.g.*, *Volucella*), the species are hairy, and some look much like small Humble-bees. There are numerous species in the genus *Syrphus*, a good many of which are British. The larvæ are of much assistance to gardeners, by destroying the Aphides, or Green-flies. The larvæ of the various species are much alike; all of them are fleshy, and taper from the hinder end to the pointed anterior part, in which is situated the mouth. The body is ringed, and the larva moves very much as a leech does, by contracting and lengthening its body. The female fly lays her eggs on twigs infested by Aphides. The larvæ, so soon as hatched, begin to feed on these insects, seizing them one by one, holding each in the air till sucked dry, and then seizing and sucking another. When full-fed, the larvæ fix themselves by the tails, by means of a cement, to twigs of the plants, and, usually in a few days, the flies emerge. They should not be injured by gardeners, but should be protected as far as possible.

SYSTREPHIA. A synonym of **Ceropegia** (which *see*).

SYZYGIUM. Included under **Eugenia** (which *see*).

SZOWITZIA (named after M. Szovitz, a Hungarian botanist and traveller, who died in 1831). ORD. *Umbelliferæ*. A monotypic genus. The species is a slender, hardy, glabrous, annual herb, native of the South Caucasus region. It has slender, compound umbels of white flowers, and ternate, dissected leaves. Having little beauty, it is probably lost to cultivation.

END OF VOLUME III.

THE

DICTIONARY OF GARDENING,

An Encyclopædia of Horticulture.

The following are the Abbreviations used:—*fl.* flowers; *fr.* fruit; *l.* leaves; *h.* height; *deg.* degrees; *rhiz.* rhizomes; *cau.* caudex; *sti.* stipes.

The Asterisks (*) indicate plants that are especially good or distinct.

TABEBUIA (said to be the native name in Brazil). ORD. *Bignoniaceæ*. A genus embracing nearly sixty species of stove, glabrous, pubescent, or villous, erect trees or shrubs, natives of tropical America. Flowers often ample, racemose or cymose; calyx tubular, at first closed, afterwards variously cut at apex; corolla tube elongated, straight or scarcely incurved; limb spreading, sub-bilabiate, of five rounded, nearly equal lobes; stamens four, didynamous. Capsules oblong or elongated, subterete. Leaves opposite or slightly scattered, simple (one-foliolate ?), trifoliolate, or often digitately five to seven-foliolate; leaflets petiolulate, entire or toothed. Few of the species are in cultivation. They require precisely similar treatment to that recommended for **Tecoma** (under which these plants are sometimes included).

T. æsculifolia (Horse Chestnut-leaved). *fl.*, corolla orange-coloured, sub-campanulate, the three lower lobes marked with yellow spots; panicle terminal, sub-corymbose. June. *l.* digitate; leaflets seven, obovate-oblong, shortly acuminate, narrowed at base, membranous, pubescent above, canescent-tomentose beneath. Branchlets pubescent. *h.* 20ft. Mexico. Tree. SYN. *Bignonia æsculifolia*.

T. chrysantha (golden-flowered). This is the correct name of the plant described in this work as *Bignonia chrysantha*. SYN. *Tecoma chrysantha*.

T. leucoxyla (white-wooded). This is the correct name of the plant described in this work as *Bignonia pallida*. SYN. *Bignonia leucoxyla* (of Velloso).

T. serratifolia (serrate-leaved). *fl.*, corolla yellow, glabrous, 2in. to 2½in. long, narrowly infundibular; corymbs contracted. *l.* chartaceous, devoid of scales; leaflets five, 3in. to 5in. long, oblong-lanceolate, shortly acuminate, sub-entire. *h.* 20ft. West Indies, 1822. Tree. SYN. *Tecoma serratifolia*.

T. spectabilis (showy).* This is the correct name of the plant described in this work as *Bignonia spectabilis*. SYN. *Tecoma spectabilis* (F. d. S. 948).

TABERNÆMONTANA (named in honour of James Theodore Tabernæmontanus, of Heidelberg, a celebrated physician and botanist, who died in 1590). SYNS. *Pandaca*, *Reichardia* (of Dennstaedt). Including *Conopharyngia*. ORD. *Apocynaceæ*. A genus comprising about 110 species of stove, evergreen, often glabrous trees or shrubs, broadly dispersed over tropical regions. Flowers white or yellowish; calyx usually small, five-lobed or five-parted; corolla salver-shaped, the throat not scaly, the lobes contorted; anthers sagittate, very acute; cymes scarcely branched. Berries or follicles two, globose, oblong, ovoid, or recurved-reniform, smooth or three-ribbed. Leaves opposite, slender or coriaceous, penniveined. The species, a select few of which are here described, are interesting plants. *T. utilis* (a species probably not in cultivation), when tapped, yields a copious supply of thick, sweet milk, resembling that of the cow in appearance, but in substance rather sticky, owing to the presence of caoutchouc. A mixture of loam, sand, and peat, is the most suitable soil for Tabernæmontanas. Young plants are obtainable by means of cuttings, inserted in sand, under a glass, in moist heat. Except where otherwise indicated, all the under-mentioned species are shrubs, having white flowers.

T. Amsonia (Amsonia). A synonym of *Amsonia Tabernæmontana*.

T. amygdalifolia (Almond-leaved). *fl.* highly odorous; corolla segments obovate, undulated, nearly equal to the tube; cymes dichotomous, one-third to half the length of the leaves. July. *l.* oval-lanceolate or obovate-oblong, acute at both ends, 2in. to 5in. long, shining; petioles ¼in. to ½in. long. *h.* 6ft. South America, 1780. (B. R. 338.)

T. Barteri (Barter's).* *fl.* 1in. long; corolla tube slightly dilated at base and apex, the segments oblong-obovate, obtuse, rather shorter than the tube; peduncles dichotomously branched, few-flowered, shorter than the leaves. Summer. *l.* oblong, attenuated at both ends, the upper ones 2in. to 3in. long, in unequal whorls; petioles dilated and slightly connate at base. Branches pale. *h.* 6ft. Western tropical Africa, 1870. (B. M. 5859.)

T. coronaria (crowned).* Adam's Apple; East Indian Rose Bay. *fl.* odorous at night; corolla tube ¾in. long, the segments oblong, obtuse, rather longer than the tube; peduncles in pairs from the forks of the branches, erect, dichotomous, four to six-flowered. July. *l.* opposite, unequal, elliptic-oblong, acute at base, obtuse and acuminate at apex, 3in. to 4in. long, membranous. Branches dichotomous. *h.* 4ft. Native country unknown; cultivated throughout India. 1770. (B. R. 1064; L. B. C. 406.) There is a double-flowered form, *flore-pleno*. (B. M. 1865, under name of *Nerium coronarium*.)

T. densiflora (dense-flowered). A synonym of *Rauwolfia densiflora*.

Tabernæmontana—*continued.*

T. dichotoma (dichotomous). *fl.* slightly odorous, 1in. long; corolla segments slightly exceeding the tube; cymes terminal, dichotomously branched, many-flowered, nearly equalling the leaves; peduncles naked, 3in. to 6in. long. September. *l.* oblong, acute at base, obtuse at apex, 2½in. to 5in. long; petioles six to ten lines long, embraced by the sheath-like stipules. Branches terete. *h.* 6ft. India, 1840. (B. R. 1841, 53.) SYN. *Cerbera dichotoma* (L. B. C. 1516).

T. grandiflora (large-flowered). *fl.* yellow, inodorous; calyx lobes ⅔in. long, leafy, gland-bearing towards the base; corolla tube fourteen lines long, the lobes obovate, very obtuse, shorter; peduncles terminal, twice-forked, few-flowered. Summer. *l.* oval or elliptic-obovate, acute at base, long and acutely cuspidate at apex, 2in. to 4in. long, one in each pair smaller, glabrous. Branchlets dichotomous. *h.* 6ft. British Guiana and Venezuela, 1823. (B. M. 5226.)

T. gratissima (very sweet-scented). A synonym of *T. recurva.*

T. laurifolia (Laurel-leaved). *fl.* yellow; corolla lobes linear-oblong, shorter than the tube; cymes contracted; peduncle about as long as the petioles. May. *l.* oval or oval-oblong, 4in. to 8in. long, blunt at both ends. *h.* 10ft. West Indies, 1768. Stove shrub. (B. R. 716.)

TABLE MOUNTAIN PINE. *See* **Pinus pungens.**

TACAMAHAC. *See* **Populus balsamifera.**

TACCA (the Malay name). SYN. *Ataccia.* ORD. *Taccaceæ.* A genus comprising about nine species of stove, perennial herbs; three are natives of tropical America, and the rest inhabit various tropical regions. Berry (? always) indehiscent. Other characteristics those of the order (which *see*). The species best known to cultivators are here described. The tubers of *T. pinnatifida* contain a great deal of starch, known as South Sea Arrowroot, and largely employed as an article of diet throughout the tropics. A compost of loam, peat, and sand, is most suitable for the culture of these plants. They must be very sparingly watered while in a dormant state. Propagation may be effected by division of the roots.

T. artocarpifolia (Artocarpus-leaved). *fl.* very numerous, on pedicels 1in. to 3in. long, the sterile, pendulous ones filiform;

FIG. 1. UPPER PORTION OF SCAPE, WITH FRUITS, OF TACCA PINNATIFIDA.

perianth brown at base, the rest green, glabrous, the segments broadly ovate; involucre of six or seven leaves; scape 5ft. to 6ft. high. May. *l.* about three, 2ft. to 3ft. in diameter, trisected; segments stalked, pinnatifid; petioles 2ft. long, stout, erect. Root tuberous. Madagascar, &c., 1872. (B. M. 6124.)

T. aspera (rough). A synonym of *T. integrifolia.*

T. cristata (crested). *fl.* dull purplish-brown, numerous, in a nodding, lateral umbel; involucre of four leaves, the lower ones smaller, sessile, the two upper large, flat, erect, purple in colour. Summer. *l.* lanceolate-oblong, with long, channelled, cylindrical petioles. *h.* 1½ft. to 2ft. Malaya, 1812. (B. M. 4589). SYN. *Ataccia cristata* (F. d. S. 860-1; F. M. 388; L. J. F. 186-7; R. H. 1866, 51).

T. integrifolia (entire-leaved).* *fl.* four to eleven, long-pedicellate, at first sub-erect, at length nodding; perianth green, variegated with purple and yellow; spathes ovate, twisted; scapes axillary, solitary. June. *l.* shining-green, recurved, oblong, acuminate, 8in. to 16in. long. Stem none or very short. Chittagong, 1810. (B. M. 1488.) SYN. *T. aspera.*

T. lævis (smooth). *fl.* six to twelve, umbellate; perianth greenish-violet, with a cup-like, sessile tube; involucre four-leaved; scapes axillary, solitary, shorter than the petioles. July. *l.* oblong, acuminate, glabrous, about 1ft. long. Stem none. Silhet, Khasya, Assam, Birma, &c., 1820.

T. pinnatifida (pinnatifid).* Otaheite Salap-plant; South Sea

T. longiflora (long-flowered). *fl.*, corolla tube very long, slightly swollen below the middle; peduncles lax, about three-flowered. Summer. *l.* oblong-elliptic, abruptly acuminate, acute at base; petioles dilated at base. Sierra Leone, 1849. Tree. (B. M. 4484; F. d. S. 534.)

T. longifolia (long-leaved). *fl.* ⅔in. long; corolla lobes obovate-oblong, reflexed, equalling the tube; cymes axillary, dichotomous, many-flowered, much shorter than the leaves; peduncles thick. July. *l.* sub-sessile, oblong, acuminate, long-narrowed at base, 6in. to 10in. long, 1½in. to 2½in. broad, membranous. *h.* 6ft. British Guiana, 1849.

T. recurva (recurved). *fl.* fragrant; corolla tube glabrous, the throat fleshy, the segments eight to nine lines long, obtuse; cymes twin in the forks of the branches, spreading, recurved, much shorter than the leaves, many-flowered. June. *l.* broadly lanceolate, acute at base, obtuse and acuminate at apex, 4in. long; petioles four to six lines long. Branches terete. *h.* 6ft. Chittagong and Tenasserim, 1824. SYN. *T. gratissima* (B. R. 1084).

T. Wallichiana (Wallich's). *fl.* on pedicels twice as long as the calyx; corolla tube four to five lines long, the lobes narrow, falcate, rather obtuse; peduncles twin in the forks of the branches, spreading-recurved, dichotomous, three to five-flowered. Summer. *l.* broadly lanceolate, very shortly narrowed into the petioles, obtuse and acuminate at apex, 3in. to 4in. long; petioles very short, channelled. *h.* 2ft. to 3ft. Sumatra, 1873.

Tacca—*continued.*

Arrowroot-plant. *fl.* in a dense umbel, subtended by several leafy bracts; perianth purplish, funnel-shaped, with six sub-equal segments. June. *fr.* somewhat pear-shaped, with prominent ribs. *l.* long-petiolate, large, three-parted, the forked divisions pinnatifid down to a narrow wing, with irregular, ovate, acute segments. Stem none. Rhizome tuberous. East Indies and Society Islands, 1793. See Fig. 1. (L. B. C. 692; R. G. 582.)

TACCACEÆ. A small natural order of perennial herbs, with tuberous or creeping rhizomes, inhabiting tropical regions and China. Flowers regular, hermaphrodite, densely umbellate at the apex of an erect, leafless scape; perianth often brown, lurid, or green above, above the ovary broadly urceolate or globose-campanulate, the tube short and broad; lobes six, biseriate, sub-equal or the inner ones broader, all connivent in a globe or the outer ones (or all) spreading; stamens six; filaments very short; anthers two-celled; ovary inferior; style short, columnar; outer bracts herbaceous or coloured; inner ones long, filiform. Fruit globose, ovoid, turbinate, or elongated, often triquetrous or six-ribbed, baccate, indehiscent or rarely at length three-valved. Leaves radical, large, petiolate, sometimes undivided and entire, occasionally variously lobed and dissected. The order consists of two genera—*Schizocapsa* and *Tacca*—and includes only about ten species.

TACCARUM (name adapted from *Tacca*, from the resemblance to that genus). SYNS. *Endera, Lysistigma.* ORD. *Aroideæ* (*Araceæ*). A small genus (three or four species) of tall, stove, tuberous, Brazilian herbs. Flowers monœcious; spathe erect, the tube short and convolute, the blade gaping or explanate, oblong, acute; spadix inappendiculate, shorter than the spathe, shortly stipitate, loose-flowered, the male inflorescence ovoid or elongated longer than the petioles. Leaves long-petiolate, broadly hastate-ovate, bipinnatifid; pinnæ undulated. Two of the species have been introduced. They are closely allied to **Staurostigma** (which *see* for culture).

T. peregrinum (foreign). *fl.*, spathe olive-green, ovate, acuminate, slightly exceeding the spadix; spadix sub-cylindrical, attenuated from the base to the apex, clothed throughout with flowers, the male and female inflorescences of equal length. *l.* solitary, cotemporary with the flowers, large, tripartite, pinnatifidly compound; petioles long, terete, spotted, 3ft. high. Tuber sub-hemispherical. 1873. SYNS. *Endera conophalloidea* (R. G. 732), *Lysistigma peregrinum.*

S. Warmingianum (Dr. Warming's). *fl.*, spathe light coppery-tinted brown, 1¼ft. long, convolute below, open above; spadix shorter than the spathe; ovaries green, surrounded by four to six fleshy, dirty-brown staminodia; stamens of male flowers united into a thick, fleshy, round-topped, pinkish column; scape 8in. long. October to January. *l.* solitary, bright green, with a spread of 2ft. to 2½ft., having three principal bipinnatifid divisions; petiole 3ft. high, stout, light green, marked with numerous white lines. 1882. (G. C. n. s., xvi., p. 661; R. G. 1124.)

TACHIA (of Persoon). A synonym of **Tachigalia** (which *see*).

TACHIADENUS (from *Tachia*, a genus of the same order, and *aden*, a gland; the ovary is surrounded by a ring of glands, as in *Tachia*). ORD. *Gentianeæ.* A genus including five species of stove herbs or sub-shrubs, endemic in Madagascar. Flowers pink or white, sometimes violet with a white tube, large, few in a terminal cyme, or solitary; calyx tubular, multi-glandular within, five-cleft at apex, five-keeled or five-winged; corolla salver-shaped or funnel-like, with a long tube and five spreading, twisted lobes; stamens five. Leaves sessile or stalked, often three-nerved. Only one species has been introduced. It thrives in a mixture of sand, loam, and peat, and requires to be kept rather dry in winter. Propagated by cuttings, inserted in sand, under a hand glass, in heat.

T. carinatus (keeled).* *fl.*, calyx ⅝in. long, the obverse wings half-lanceolate, the lobes linear; corolla tube white, 2in. long, swollen at apex, the lobes violet, rounded, obtuse, less than 1in. long; cyme terminal, twice dichotomous. October. *l.* oval, sessile, three-nerved. Stem suffruticose, tetragonal. 1858. (B. M. 5094.)

TACHIGALIA (*Tachigali* is the native name in Guiana). SYNS. *Cubæa, Tachia* (of Persoon). ORD. *Leguminosæ.* A small genus (four or five species) of tropical American, unarmed, stove trees. Flowers yellow (?), very shortly pedicellate, racemose; calyx segments five, unequal; petals five, scarcely unequal; stamens ten. Leaves abruptly pinnate. *T. bijuga* and *T. paniculata* have been introduced, but are now probably lost to cultivation.

TACSONIA (from *Tacso*, the Peruvian name of one of the species). Passion Flower. Including *Poggendorffia.* ORD. *Passifloreæ.* A genus comprising about thirty species of stove or greenhouse, often pubescent, climbing shrubs, natives of tropical America, mainly differing from *Passiflora* in the usually long, cylindrical tube of the calyx, which is furnished with two crowns, one at the throat, and the other near its base. Petals five, often smaller than the calyx lobes; corona entire or filamentose; stamens five. Leaves alternate. Tendrils lateral, undivided. The species known to cultivation are here described. For culture, *see* **Passiflora.**

T. Buchanani (Buchanan's). A synonym of *Passiflora vitifolia.*

T. insignis (remarkable).* *fl.* solitary, axillary, 6in. to 8in. in diameter; tube 2in. long, with a depressed bulb at the base; sepals violet-crimson, linear-oblong, concave, with a green keel terminating below in a green spur 1in. long; petals darker crimson and shorter than the sepals, nearly flat; corona ½in. long, of one series of white threads mottled with blue; inner corona an inflexed membrane at the base of the tube above the bulb. Summer and autumn. *l.* 5in. to 7in. long, ovate or oblong, or lanceolate-ovate from a cordate base, obscurely lobed, toothed; petioles short, stout, glandular; stipules small, pinnatisect. Young parts, petioles, peduncles, and leaves beneath, clothed with pale or dark rusty-brown wool. Peru (?). Warm greenhouse. (B. H. 1874, 10; F. M. n. s. 89; G. C., 1873, 1112.) SYN. *Passiflora insignis* (B. M. 6069; F. d. S. 2083-4.)

T. manicata (collared).* *fl.* on peduncles which are longer than the petioles; tube inflated at base, ten-lobed; limb vivid scarlet, 4in. in diameter; corona double; the outer at the mouth of the tube, of many short, blue hairs; the inner at the top of the inflated base of the perianth; bracts elliptic-ovate, pubescent. July. *l.* about 4in. long, coriaceous, three-lobed to about the middle, finely serrate; lobes broadly oblong, obtuse or sub-acute, paler beneath; petioles about 1in. long, with three or four glands. Stem, leaves beneath, stipules, bracts, and perianth externally, finely pubescent. Peru, before 1850. Stove or warm greenhouse. (L. & P. F. G. i. 26.) SYN. *Passiflora manicata* (B. M. 6129).

T. mixta (mixed). *fl.* pink; tube cylindrical, 4in. to 5in. long, glabrous or pubescent; sepals and petals obtuse; bracts oblong, 1½in. to 2in. long, herbaceous or coloured, coalescing in an involucre. Late summer. *fr.* ovoid, glabrous or pubescent, edible. *l.* coriaceous, orbicular, three-lobed to the middle; lobes ovate-oblong, acute, serrated; petioles 1in. to 1½in. long, with six to eight sessile or stipitate glands. Stem angular. Andes. Plant glabrous or more or less pubescent. Greenhouse.

T. m. eriantha (woolly-flowered). *fl.* pink; bracts reticulate-nerved. Plant snowy-pubescent. (B. M. 5750, under name of *T. eriantha.*)

T. m. quitensis (Quito). *fl.*, involucre pubescent, cylindrical, equally or rarely unequally three-lobed at apex. *l.* nearly glabrous above, velvety beneath, three-lobed; lobes ovate or ovate-oblong; petiolar glands sessile. Stem velvety. (I. H. xvi. 595, under name of *T. quitensis eriantha.*)

T. m. speciosa (showy). *fl.*, involucre pubescent, unequally two or three-lobed at apex. *l.* glabrous above, pubescent beneath, three-lobed; lobes oblong-lanceolate, uncinate-serrated; petiolar glands stipitate. Stem sub-terete, glabrous.

T. mollissima (very soft).* *fl.* pink; tube cylindrical, 4in. to 5in. long, highly glabrous; bracts 1in. long, forming an urceolate involucre, irregularly cut at the top. August. *fr.* yellowish, ellipsoid, 4in. long. *l.* 4in. to 5in. long, 5in. to 6in. broad, cordate-trilobed; lobes diverging, ovate-lanceolate, serrated; petioles 1½in. long, glandular; stipules six to eight lines long, deeply serrated. Quito, 1845. Whole plant softly pubescent. Greenhouse. (B. H. vii., p. 142; B. M. 4187; B. R. xxxii. 11; F. d. S. ii. 70; P. M. B. xiii. 25.)

T. Parritæ (Parrita's). *fl.*, tube long and slender; sepals five, rosy-orange, oblong-hooded, acute-pointed; petals rich orange, oblong, flat; corona consisting of an outer row of tooth-like projections, and an inner membranous fold bent downwards; stalks cylindrical, longer than the leaves. *l.* three-lobed, glabrous above, pilose beneath; petioles channelled above; stipules entire, subulate-acuminate. Tolima, 1882. Stove or greenhouse. (G. C. n. s., xvii., p. 225.)

T. pinnatistipula (pinnate-stipuled). *fl.* pale rose-colour, 4in. to 6in. long; tube cylindrical, dilated at base; coronal filaments

Tacsonia—*continued.*

one-half shorter than the sepals and petals; bracts 1in. long, serrated; peduncles 4in. long. September. *fr.* sub-globose, tomentose, edible. *l.* coriaceous, tomentose beneath, tripartite, 3in. to 5in. long, 3½in. to 4in. broad; lobes lanceolate, serrated; petioles 1in. long; stipules 1in. long, pinnatisect. Chili and Peru, 1828. Greenhouse. (B. iv. 171; B. M. 4062; S. B. F. G. ser. ii. 156.) SYN. *Passiflora pinnatistipula* (B. R. 1536). *Poggendorffia rosea* is simply a monstrous form of this species.

T. Van-Volxemii (Van Volxem's).* *fl.* scarlet, very showy; tube cylindrical, 1½in. long, dilated at base, the limb 4in. to 5in. in diameter; sepals and petals linear-oblong; peduncles slender, twice as long as the leaves; bracts 1in. long, serrated. Late summer. *fr.* ellipsoid, edible. *l.* glabrous, 4in. to 5in. long and broad, tripartite; lobes lanceolate, narrowed at base; petioles 1½in. long, with many glands; stipules linear. New Grenada, 1866. Stove or warm greenhouse. One of the finest species. (B. M. 5571; F. M. 289; G. C. 1866, p. 171; I. H. x. 381.)

TÆNIOCARPUM. A synonym of **Pachyrhizus** (which *see*).

TÆNIOPHYLLUM (from *tainia*, a band, and *phyllon*, a leaf; in reference to the linear leaves). ORD. *Orchideæ.* A genus embracing about half-a-dozen species of stove or greenhouse, dwarf, epiphytal Orchids, almost stemless and leafless, or with a tuft of linear leaves; they are natives of the East Indies, the Malayan Archipelago, the Pacific Islands, and Australia. Flowers minute, in small racemes; sepals and petals nearly equal, erect or connivent, connate at base; lip adnate to the column at base, and produced into a short spur or pouch; pollen masses four, in two pairs. None of the species have been introduced.

TÆNIOPSIS. Included under **Vittaria** (which *see*).

TÆNITIS (from *tainia*, a fillet or ribbon; alluding to the linear pinnæ). Including *Cuspidaria, Neurodium, Paltonium*, and *Pteropsis*. ORD. *Filices.* A small genus (five species) of interesting, stove Ferns, all tropical, but not very closely allied. Sori linear, but the line sometimes interrupted, central or sub-marginal. Some of the species scarcely differ from *Tæniopsis* [included under *Vittaria*] in fruit, but in all those placed here the veins anastomose. The following species have been introduced. For culture, *see* **Ferns.**

T. angustifolia (narrow-fronded). *fronds* 1ft. to 1½ft. long, ¼in. to ⅓in. broad, narrowed very gradually to an acute point and below to the base or a short stem, flaccid; midrib distinct; veins immersed, forming two or three rows of vertical, hexagonal areolæ. *sori* sunk in a groove, a short distance from the edge. Cuba to North Brazil, 1816. SYN. *Pteropsis angustifolia.*

T. blechnoides (Blechnum-like). *rhiz.* creeping. *sti.* 8in. to 12in. long, firm, naked, glossy. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad, simply pinnate; pinnæ of barren fronds two or three on each side, 6in. to 9in. long, 1in. to 2in. broad, oblong-lanceolate, acuminate, cuneate at base, the edge thickened and wavy, the lower ones stalked; fertile pinnæ narrower and more numerous. *sori* in a continuous line about midway between the edge and midrib. Malaccas and Philippines.

T. b. interrupta (interrupted). *fronds*, pinnæ smaller than in the type. *sori* interrupted and much nearer the edge.

T. furcata (forked). *rhiz.* somewhat creeping, densely tomentose. *fronds* 6in. to 18in. long, once or twice dichotomously forked or sub-pinnatifid; lobes linear, erecto-patent, much acuminated, entire, 4in. to 8in. long, ¼in. to ½in. broad, coriaceous, minutely scaly below. *sori* sub-marginal, continuous or interrupted. West Indies, &c., 1824. SYNS. *Cuspidaria furcata, Pteropsis furcata.*

T. lanceolata (lance-shaped). *rhiz.* creeping, very stout. *sti.* 1in. to 2in. long, firm, erect. *fronds* 6in. to 12in. long, 1in. to 2in. broad, gradually narrowed from the centre to both ends, the edge entire but often crisped, firm, coriaceous, with a distinct midrib; areolæ immersed. *sori* in continuous or interrupted lines near the edge of the contracted upper third or quarter of the frond. West Indies and Guatemala, 1818. SYNS. *Neurodium lanceolatum, Paltonium lanceolatum.*

TÆTSIA. A synonym of *Cordyline.*

TAGETES (a name of mythological derivation, from Tagus, one of the Etruscan deities). Marigold. ORD. *Compositæ.* A genus comprising about a score species of mostly hardy, erect and branched or diffuse, annual herbs, natives of the warmer parts of America. Flower-heads yellow or orange, long-pedunculate or densely corymbose; ray florets one-seriate, solitary, or rarely deficient; disk hermaphrodite; involucral bracts one-seriate; receptacle

Tagetes—*continued.*

flat, often small; achenes linear, glabrous or pilose. Leaves opposite, pinnately dissected or rarely undivided and serrulated. The best-known species are here described. For culture, and further remarks respecting *T. erecta* and *T. patula*, *see* **Marigold.**

T. corymbosa (corymbose) A synonym of *T. patula.*

FIG. 2. FLOWERING BRANCHLET OF TAGETES ERECTA.

T. erecta (erect).* African Marigold. *fl.-heads* citron-yellow, twice the size of those of the French Marigold; involucre sub-angular; peduncles one-headed, thickened at the apex. July.

FIG. 3. FLOWERING BRANCH OF TAGETES PATULA.

Tagetes—*continued.*

l. pinnatisect; segments lanceolate, serrulated; serratures, especially those of the upper leaves, aristate. Stems and branches erect. *h.* 2ft. Mexico, 1596. See Fig. 2.

T. florida (flowery). A synonym of *T. lucida.*

T. glandulifera (gland-bearing). *fl.-heads* pale yellow, fascicled-corymbose; involucre cylindrical. October. *l.* alternate, pinnatisect; segments thirteen to seventeen, linear-sub-lanceolate, acuminate at each end, 1½in. or more long. Stems and branches erect, the latter short. *h.* 4ft. South America, 1826.

T. lucida (shining). Sweet-scented Mexican Marigold. *fl.-heads* yellow; involucre cylindrical. August. *l.* lanceolate, argutely serrated, aristate-serrated at base. Stems erect, scarcely branched. *h.* 1ft. Mexico and South America, 1798. Half-hardy. (A. B. R. 359; B. M. 740.) This species varies in having the lower leaves obtuse, and the upper ones acute and narrower. SYN. *T. florida* (S. B. F. G. ser. ii. 35).

T. patula (spreading).* French Marigold. *fl.-heads* fuscous-golden or fulvous; involucre smooth; peduncles elongated, one-headed, nearly cylindrical. August. *l.* pinnatisect; segments linear-lanceolate, serrated; serratures, especially the upper ones, aristate. Stems erect; branches spreading. *h.* 1½ft. Mexico, 1573. See Fig. 3. (B. M. 150.) SYN. *T. corymbosa* (B. M. 3830; S. B. F. G. 151).

T. signata (distinct). Striped Mexican Marigold. *fl.-heads* yellow; involucre oblong-ovate, five-angled; peduncles one-headed, scarcely thickened above. Summer. *l.* pinnatisect, segments six pairs, oblong-lanceolate, incised-serrated, the lower serratures aristate. Stems erect, branched. *h.* 1½ft. Mexico.

FIG. 4. TAGETES SIGNATA PUMILA, showing Habit and detached Portion of Inflorescence.

T. s. pumila (dwarf). This is of dwarfer, more compact habit than the type. See Fig. 4. (R. H. 1863, p. 11.)

T. tenuifolia (slender-leaved).* *fl.-heads* yellow, unspotted; ray florets ample, nearly round; involucre obovate, smooth, shorter than the disk; achenes black. August. *l.* opposite or alternate, pinnatisect; segments thirteen to seventeen, linear, serrated, the serratures of the upper leaves aristate. *h.* 2ft. Mexico and Peru, 1797. Plant erect, slightly branched. (B. M. 2045; S. F. G. 141.)

TAIL-FLOWER. A common name for *Anthurium.*

TAILS. The long, feathery or hairy terminations of certain fruits.

TAINIA (from *tainia*, a band or fillet; in allusion to the shape of the lip). SYNS. *Ania, Mitopetalum.* ORD. *Orchideæ.* A small genus (six or seven species) of stove orchids, natives of the East Indies, South China, and the Malayan Archipelago. Flowers pedicellate, scattered, rather large or mediocre; sepals and petals narrow, slightly acute or long-acuminate; lip erect; column rather long; pollen masses eight; scape florid, tall, leafless, few-sheathed at base; raceme terminal, simple. Stems at length thickened into pseudo-bulbs. Only two species call for mention here. For culture, *see* **Calanthe.**

T. bicornis (two-horned). *fl.*, sepals and petals green, with a reddish tinge; lip yellow, blotched with red, the middle lobe emarginate, apiculate, not spurred, having two lamellæ at base; anthers two-horned. March. *l.* oblong-lanceolate, fleshy, shorter than the scape. Ceylon, about 1842. SYN. *Ania bicornis* (B. R. xxx. 8).

T. latifolia (broad-leaved). *fl.* green and brown; petals slightly spreading; lip unguiculate, produced with the column in a connate, trilobed sac, the lateral lobes obtuse, the middle one acute, shorter; scape 2ft. long. *l.* oblong, plicate, shorter than the scape. Sylhet, 1852. SYN. *Calanthe viridi-fusca* (B. M. 4669).

TALAUMA (the vernacular name of the South American species). ORD. *Magnoliaceæ.* A genus embracing about fifteen species of mostly stove, evergreen trees; three or four are natives of tropical America, and the rest inhabit tropical Asia and Japan. Flowers and leaves as in *Magnolia*; but the fruit differs in the fusion of its constituent carpels, and in the irregularly circular mode of splitting. The under-mentioned species are well worth cultivating on account of their beautiful and fragrant flowers. A compost of loam, peat, and sand is most suitable. Propagation may be effected by layers, or by inarching on some of the stronger-growing Magnolias. Ripened cuttings, with the leaves intact, will sometimes root if inserted in a pot of sand, under a glass, in heat.

T. Candollii (De Candolle's). *fl.* cream-coloured, large; petals nine to twelve, the outer one short; peduncles one-flowered, rather drooping, and, as well as the petioles of the younger leaves, clothed with rufous hairs. June and July. *l.* oblong, acuminate at both ends. *h.* 6ft. Java, 1828. (B. M. 4251; B. R. 1709.)

T. C. Galeottiana (Galeotti's). *fl.* dull yellow, 3in. in diameter; sepals and petals narrower than in the type. *l.* 4in. to 7in. long, narrowly elliptic-lanceolate. (B. M. 6614.)

T. Hodgsoni (Hodgson's). *fl.* creamy-white, large, terminal, solitary; sepals reddish-tinted outside, thick; petals six, the inner ones smaller. Winter and spring. *fr.* large; carpels sub-tetragonal, argutely beaked. *l.* ample, obovate-oblong, coriaceous, glabrous, the margins slightly sinuated. Himalayas. A medium-sized tree. (I. H. 1857, 141.)

T. Plumieri (Plumier's). *fl.* white, large, terminal, solitary; petals ten to twelve. All the year. *l.* oval-oblong, glabrous, 6in. long, varying in breadth from 3in. to 5in., coriaceous. *h.* 12ft. West Indies, 1829.

T. pumila (dwarf).* *fl.* cream-coloured, drooping, very fragrant at night; petals six to nine. All the year. *l.* elliptic, acuminate at both ends, smooth, reticulate-veined. *h.* 2ft. to 4ft. Amboyna and Java, 1786. The correct name of this plant is *Magnolia pumila* (A. B. R. 226; B. M. 977; L. B. C. 1555).

TALEA. A cutting; a small branch used for propagation.

TALEWORT. An old name for Borage (*Borago officinalis*).

TALIERA. A synonym of **Corypha** (which *see*).

TALIGALEA (said to be the native name in Guiana). *Amasonia* is now the correct name of this genus. ORD. *Verbenaceæ.* A genus comprising six species (which may be reduced to four) of stove sub-shrubs, natives of tropical America. Flowers yellow or sulphur-coloured, racemose or panicled; calyx coloured, loosely campanulate, membranous, five-cleft; corolla tube elongated, straight or incurved at base, the limb five-cleft, sub-bilabiate, with short, spreading or reflexed lobes. Leaves alternate, toothed or rarely entire; upper ones few, small. For culture of the only species introduced, *see* **Clerodendron.**

T. punicea (reddish-brown). *fl.* pale sulphur-yellow, with large, bright red bracts; racemes nodding, clothed with red-purple hairs. May and June. *l.* slender, 6in. to 12in. long, oblong- or elliptic-lanceolate, shortly acuminate, unequally toothed. Stem erect, simple or slightly branched. *h.* 2ft. to 3ft. Brazil, 1884. The correct name of this plant is *Amasonia calycina.* (B. M. 6915.) SYN. *Amasonia punicea* (Gn. xxvii. 130; R. G. 1886, 337).

TALINUM (said to be the name given to the plant by the negroes of Senegal, who eat it as a salad; but it may have been invented by Adanson). ORD. *Portulaceæ.* A genus comprising about eleven species of stove, greenhouse, or hardy, fleshy, highly glabrous, sometimes suffrutescent herbs, inhabiting tropical and warm regions: two are African and Asiatic, and the rest American. Flowers disposed in terminal panicles, cymes, or racemes, rarely solitary, axillary or lateral;

Talinum—*continued.*

sepals two, deciduous or rarely sub-persistent; petals five, hypogynous, ephemeral; stamens five or numerous. Leaves alternate or nearly opposite, flat; stipules wanting. The best-known species are here described. They are pretty succulents, and will thrive in any light soil; but they prefer sandy peat. Cuttings are a ready means of increase for the shrubby species. *T. reflexum* may be multiplied by seeds.

FIG. 5. UPPER PORTION OF PLANT, AND PORTION OF DETACHED INFLORESCENCE, OF TALINUM TERETIFOLIUM.

T. Arnotii (Arnot's).* *fl.* pale golden-yellow, 1in. in diameter; petals obovate, acute; peduncles axillary, one-flowered, longer than the leaves, spreading, with a small bract above the middle. Summer. *l.* attenuated, almost sessile, $1\frac{1}{2}$in. long and nearly as broad, orbicular-oblong, rounded at both ends, apiculate at the tip, fleshy, the margins quite entire. Branches 1ft. long, succulent. Trunk or rootstalk cylindric, woody, 5in. to 8in. long. South Africa, 1867. Greenhouse sub-shrub. (B. M. 6220.)

Talinum—*continued.*

T. cuneifolium (wedge-shape-leaved). *fl.* of a reddish-violet colour, disposed in a terminal panicle; lower peduncles three-flowered. July and August. *l.* flat, wedge-shaped, obtuse, mucronate. Stem erect, $1\frac{1}{2}$ft. high. India, Arabia, and Africa, 1820. Greenhouse sub-shrub.

T. patens (spreading). Puchero. *fl.* carmine; petals obovate, $\frac{1}{4}$in. long; stamens fifteen to twenty; panicle terminal, elongated, leafless, bearing dichotomous cymes. August to October. *l.* mostly opposite, oval, abruptly tapering towards the petioliform base. Stem erect, almost simple, 1ft. to 2ft. high. West Indies, 1776. Stove sub-shrub. (A. B. R. 253.)

T. reflexum (reflexed). *fl.* yellow, in a terminal panicle; peduncles usually opposite, dichotomous, bractless. August to October. *l.* flat, lanceolate or oval, obtuse, usually opposite. Stem erect, 1ft. high. South America, 1800. Stove biennial. (B. M. 1543.)

T. teretifolium (terete-leaved). Fame Flower. *fl.* pink, $\frac{3}{4}$in. broad; stamens fifteen to twenty; peduncle 3in. to 6in. long, naked, bearing an open cyme. June to August. *l.* linear, cylindrical. Leafy stems low, tuberous at the base. North America, 1823. Greenhouse perennial. See Fig. 5. (B. R. xxix. 1; L. B. C. 819.)

T. triangulare (triangular). *fl.* red or white, arranged in terminal, corymbiferous cymes; petals rounded, $\frac{1}{2}$in. long; stamens about thirty. August and September. *l.* alternate, obovate-lanceolate, tapering towards the sub-sessile base. Stem simple, about 2ft. high. West Indies, 1739. Stove sub-shrub.

T. t. crassifolium (thick-leaved). *l.* usually broader, often emarginate and mucronate. Stem higher and branched.

TALIPOT PALM. A common name for **Corypha umbraculifera** (which *see*).

TALISIA (said to be the native name of some members of the genus in Guiana). SYN. *Comatoglossum.* ORD. *Sapindaceæ.* A genus including about eighteen species of stove, evergreen trees, inhabiting Brazil, New Grenada, and Guiana. Flowers mediocre or small, in branched panicles; sepals erect, biseriate; petals five, rarely more, unguiculate, the margins villous; stamens eight, rarely five or seven. Leaves alternate, exstipulate, abruptly pinnate; leaflets alternate and opposite, coriaceous, oblong, acuminate, entire. *T. guianensis*, the only species introduced, thrives in a compost of turfy loam and peat. Large cuttings, with the leaves intact, will root in sand, under a glass, in moist heat.

T. guianensis (Guiana). *fl.* rose-coloured, disposed in decompound racemes; calyx shorter than the petals. June. *l.*, leaflets many pairs, ovate-lanceolate, acuminate, coriaceous, quite smooth on both surfaces. *h.* 4ft. Guiana and Cayenne, 1824. (A. G. 136.)

TALLIES. Another name for labels made of wood, cast iron, porcelain, and other substances, for permanently attaching to plants or trees. *See* **Labels.**

TALLOW SHRUB. A common name for **Myrica cerifera** (which *see*).

TALLOW-TREE, CHINESE. A common name for *Stillingia sebifera.*

TALLOW-TREE, SIERRA LEONE. A common name for **Pentadesma butyracea** (which *see*).

TALPA EUROPÆA. *See* **Mole.**

TAMARIND-TREE. *See* **Tamarindus indica.**

TAMARINDUS (from the Arabic, *tamr*, a ripe date, and *Hind*, India; literally, Indian Date). ORD. *Leguminosæ*. A monotypic genus. The species is a large, stove, unarmed tree. Its medicinal virtues, as far as the fruits are concerned, are well known. The bark, wood, leaves, and flowers are all economically valuable. A compost of fibrous loam and sand is most suited to the requirements of *T. indica*. Seeds, which are annually imported from the East and West Indies, should be sown on a hotbed, and the young plants, when about 3in. high, inserted singly in pots. Cuttings also root readily in sand, under a glass, in heat.

T. indica (Indian). Tamarind-tree. *fl.* few together in copious, lax racemes at the ends of the branchlets; petals yellow, striped with red, less than $\frac{1}{2}$in. long, only the three upper ones developed; pedicels articulated at the base of the calyx. June and July. *fr.*, pods 3in. to 6in. by 1in. or more, three to ten-seeded, ligulate. *l.* abruptly pinnate, with twenty to forty close, opposite, oblong, obtuse, glabrescent leaflets. *h.* 40ft. to 60ft. Tropics (probably indigenous in Africa), 1633. (B. F. S. 184; B. M. Pl. 92). SYNS. *T. occidentalis*, *T. officinalis* (B. M. 4563). The West Indian pods are generally shorter than those grown in the East Indies.

T. occidentalis (Western). A synonym of *T. indica*.

T. officinalis (officinal). A synonym of *T. indica*.

TAMARISCINEÆ. A natural order of shrubs, sub-shrubs, and rarely trees or durable herbs, found mostly in the temperate and warmer regions of the Northern hemisphere, and also in South Africa. Flowers often white or pink, regular, often hermaphrodite, fleshy, small or showy, variously disposed; sepals three, rarely four, free or connate at base, closely imbricated; petals five, rarely four, inserted under the disk, imbricated, free, or the base cohering in a tube; disk hypogynous or loosely perigynous, ten-glandular, crenate or angular, rarely obsolete; stamens five or numerous, inserted on the disk, free or variously connate at base; anthers two-celled; ovary free. Capsule dehiscent, coriaceous. Leaves alternate, small, sometimes scale-like, entire and often fleshy or impressed-dotted; stipules none. *Tamariscineæ* contain tannin, resin, and a volatile oil, which render them bitter and astringent. The order embraces five genera—*Fouquiera*, *Hololachne*, *Myricaria*, *Reaumuria*, and *Tamarix*—and scarcely forty species.

TAMARISK. *See* **Tamarix.**

TAMARIX (the old Latin name used by Pliny). Tamarisk. ORD. *Tamariscineæ*. A genus comprising about twenty species of very elegant, greenhouse or hardy bushes or small trees, distributed where the order extends. Flowers white or pink; sepals four or five, rarely six, free; petals inserted under the disk, free or lightly connate at base; stamens four, five, eight, or ten; anthers apiculate; disk more or less lobed; inflorescence of lateral or terminal spikes or dense racemes. Leaves minute, scale-like, amplexicaul or sheathing. The manna of Mount Sinai, which consists wholly of mucilaginous sugar, is produced by a variety of *T. gallica*. Sandy loam is most suitable to the culture of the greenhouse sorts. *T. gallica* will thrive under almost any conditions, and is admirably suited for ornamenting shrubberies; it is also invaluable as a seaside plant, and is very extensively employed along the South Coast. Propagation may be readily effected by cuttings, inserted in sand, under a bell glass, the greenhouse kinds in heat.

T. africana (African). A synonom of *T. parviflora*.

T. articulata (jointed). *fl.* pink, $\frac{1}{8}$in. in diameter, sub-sessile; spikes slender, more or less interrupted, usually sessile. July. *l.* reduced to a very short sheath, with a minute tooth. Branches fastigiate, elongated, slender, cylindric, jointed. *h.* 10ft. to 25ft. India. A greenhouse bush or coniferous-looking tree. SYN. *T. orientalis*.

T. dioica (diœcious). *fl.* pink, $\frac{1}{8}$in. in diameter, diœcious; spikes dense, panicled, 1in. to 2in. long, about equalling their peduncles. June. *l.* sheathing, glabrous, green, obliquely truncate and acuminate. Branches with drooping extremities; ultimate

Tamarix—*continued.*

branchlets elongated, spreading-fastigiate. *h.* 6ft. India, 1823. A small, greenhouse tree.

T. gallica (French).* Common Tamarisk. *fl.* white or pink, in catkin-like, obtuse spikes 1in. long; disk acutely five angled. July to September. *l.* on the branchlets extremely minute, closely imbricated, triangular, auricled, keeled; those on the older wood $\frac{1}{8}$in. long, subulate. Branchlets excessively slender and feathery. *h.* 5ft. to 10ft. India to Europe. Hardy shrub or small tree.

FIG. 6. FLOWERING BRANCH OF TAMARIX GALLICA INDICA.

T. g. indica (Indian). *fl.*, lobes of the disk entire or nearly so. *l.* semi-amplexicaul. Branchlets divaricate. Greenhouse. See Fig. 6.

T. g. Pallasii (Pallas'). *fl.* rosy-pink; lobes of disk deeply emarginate. *l.* shortly decurrent. Branchlets erect. Thibet, &c.

T. orientalis (Eastern). A synonym of *T. articulata*.

T. parviflora (small-flowered).* *fl.* pink, small; spikes or racemes lateral, crowded, nine to ten lines long. Summer. *l.* small, lanceolate, subulate, a little keeled, acute. South-eastern Europe, Levant. Hardy shrub. (F. d. S. 898.) SYNS. *T. africana*, *T. tetrandra*, of gardens (R. H. 1856, 401).

T. tetrandra (four anthered). *fl.* white; racemes lateral, nearly $1\frac{1}{2}$in. long. July. *l.* lanceolate, amplexicaul; adult ones diaphanous at apex. *h.* 6ft. to 8ft. Caucasus, 1821. Hardy shrub.

T. tetrandra (four-anthered), of gardens. A synonym of *T. parviflora*.

TAMNUS. A synonym of **Tamus** (which *see*).

TAMONEA (from *Tamone*, the name of the genus in Guiana). SYNS. *Ghinia*, *Ischnia*, *Kaempfera*, *Leptocarpus*. ORD. *Verbenaceæ*. A small genus (four species) of erect, stove herbs or sub-shrubs, natives of tropical America. Flowers small, few in a spike; corolla limb spreading, five-cleft. Leaves opposite, small, sub-sessile. *T. spicata* and *T. verbenacea* have been introduced, but are now probably lost to cultivation.

TAMONEA (of Aublet). Included under **Miconia** (which *see*).

TAMUS (the old Latin name used by Pliny). SYN. *Tamnus*. ORD. *Dioscoreaceæ*. A small genus (two species) of greenhouse or hardy, tuberous-rooted twiners; one is a native of the Canary Islands, and the other is broadly dispersed over Europe, North Africa, and temperate Asia. Flowers diœcious; racemes axillary; males often elongated, loose, the flowers disposed in small, few-flowered racemes, or solitary and pedicellate at the sides of the rachis; females very short, few-flowered, sometimes reduced to a sessile fascicle. Berry sub-globose, succulent, indehiscent. Leaves alternate, cordate, entire or three-lobed. *T. communis* is the only species calling for description here. It thrives in any ordinary soil, and may be increased by divisions of the root; or by seeds, raised in a cold frame.

T. communis (common). Black Bryony; Lady's Seal; Murrain Berries, &c. *fl.* ⅙in. in diameter; female racemes 1in. shorter than the males, recurved, few-flowered. May and June. *fr.* red, oblong, ½in. long. *l.* ovate-cordate, acuminate, 2in. to 3in. long, on long petioles, obscurely laterally lobed, five to seven-nerved, the tips bristly; stipules reflexed. Stem many feet long, angular, branched. Rootstock ovoid, black, fleshy. Europe (Britain), &c. (Sy. En. B. 1508.)

TAN, or TANNERS' WASTE. This consists of the bark of various trees, chiefly the Oak, Larch, and Willow. The tannin is extracted for the purpose of tanning leather, and a large quantity of refuse remains to be disposed of. This refuse is frequently employed for making hotbeds, as it gives a steady heat for a considerable time, the heat being more easily regulated, and retained longer, than that obtained from pure stable-yard manure. In general, however, a mixture of manure and dead leaves is preferred to Tan, as, when it has lost its heat, and has to be replaced in the hotbed, this mixture forms a valuable manure for the soil; while Tanners' Waste decays slowly, and is of little value as manure. Analysis shows that the nitrogenous matters of the fresh bark are almost entirely removed from it in the processes of extracting the tannin; while some of the tannin remains, and hinders decay of the refuse. Nearly half the weight of the Tan is water; and the ash, or mineral compounds in the Tan, consists very largely of Carbonate of Lime, and of Silica; the valuable Phosphates and Potash salts being present in it only in very small quantity. If employed as manure, Tan should be made up into a compost with earth, lime, and farmyard manure, and the whole should be saturated occasionally with liquid manure, and allowed to ferment for a considerable time before it is used.

TANACETUM (said to be an altered form of Athanasia, from *athanatos*, immortal; in allusion to the persistent flowers). Tansy. ORD. *Compositæ*. A genus embracing about thirty species of mostly hardy, erect, often odorous, annual or perennial herbs, often suffrutescent at base, natives of Europe, North Africa, Central and Northern Asia, and North America. Flower-heads yellow, small or mediocre, corymbose, or rarely solitary and long-pedunculate, disk-formed; involucre hemispherical or campanulate, rarely ovoid, the bracts many-seriate; receptacle flat or slightly convex, naked; achenes and florets often glandular. Leaves alternate, variously dissected, or rarely entire and toothed. The species are not possessed of much beauty. Those here described are perennials, thriving in ordinary soil. Propagated by divisions.

T. Balsamita (Balsamita). Costmary. *fl.-heads* yellow, in branched corymbs; ray very small or absent. Autumn. *l.* elliptic, obtuse, minutely and regularly crenate-dentate, the radical ones stalked, often sub-cordate. *h.* 2ft. to 3ft. Orient (naturalised in several European countries). SYN. *Balsamita vulgaris*.

T. elegans (elegant). A synonym of *T. huronense*.

T. huronense (Lake Huron). *fl.-heads* golden-yellow, twin or sub-corymbose; involucre campanulate; florets thickened at base and apex. Summer. *l.* bipinnate; lobes short, rounded, entire or three-lobuled, the margins revolute. Stem erect, branched, and (as well as the young leaves) silvery-velvety. *h.* 1½ft. North America. SYN. *T. elegans* (F. d. S. 1191).

T. leucophyllum (white-leaved).* *fl.-heads* golden-yellow, corymbose; involucre hemispherical, with imbricated bracts; florets slightly exceeding the involucre; peduncles solitary in the axils of the upper leaves. Summer. *l.* sessile or shortly petiolate, roundish-ovate; lower ones bipinnatisect; upper ones pinnatisect. Stems ascending. *h.* 9in. Turkestan. Plant silvery-silky. (R. G. 1064.)

T. vulgare (common). Buttons; Common Tansy. *fl.-heads* many, ⅓in. in diameter, corymbose; peduncle stout. August and September. *l.* 2in. to 5in. long, once or twice pinnatifid, oblong, glandular-dotted; upper ones half-amplexicaul; lower ones petiolate. Stem 2ft. to 3ft. high, grooved and angled, leafy. Europe (Britain), &c. (F. D. v. 871; Sy. En. B. 716.) A variety with curled leaves is cultivated as an ornamental plant for garnishing dishes.

TANGHIN. *See* **Tanghinia.**

TANGHINIA (*Tanghin* is the native name of the plant in Madagascar). ORD. *Apocynaceæ*. A monotypic genus. The species is a small, glabrous, stove, evergreen tree, included, by Bentham and Hooker, under *Cerbera*. Its fruit is known as the Ordeal Nut of Madagascar. For culture, *see* **Cerbera.**

T. venenifera (poison-bearing). Ordeal-tree. *fl.* in large, terminal cymes, each supported by a couple of bracts; corolla salver-shaped, with rose-coloured lobes and a green, funnel-shaped tube, which is hairy within. May. *fr.* purplish, tinged with green, ellipsoid, 2in. to 3in. long, containing a hard stone. *l.* smooth, alternate, lanceolate, rather thick, about 6in. long, clustered towards the points of the branches and directed upwards. *h.* 20ft. Madagascar, 1826. (B. M. 2698, under name of *Cerbera Tanghin.*) The seeds of this plant furnish a powerful poison, and were formerly largely used as an ordeal by the kings of Madagascar. For a full and very interesting historical account, see Mr. Telfair's letter published in the "Botanical Magazine" at the figure quoted.

TANK. A cistern or reservoir, which, on a large or small scale, is invaluable in every garden for collecting and preserving water until required for use. Every horticultural structure should be provided with a Water-tank in some convenient position into which the rain-water that falls on the roof should be conducted, and an additional means of supply provided, if possible, to use when this fails. Tanks may be built, in any size desired, with bricks and cement, or purchased, ready for fixing, made of galvanised iron or slate.

TANKERVILLIA. A synonym of **Phaius** (which *see*).

TANNER'S-TREE. An old name for **Coriaria myrtifolia** and other species.

TANSY. *See* **Tanacetum vulgare.**

TAONABO. A synonym of **Ternstrœmia** (which *see*).

TAPE GRASS. *See* **Vallisneria spiralis.**

TAPEIONITES. Included under **Sinningia** (which *see*).

TAPER. The opposite of angular. *See* **Terete.**

TAPIOCA-PLANT. A common name for **Manihot utilissima** (which *see*).

TAPOGOMEA. A synonym of **Cephaelis** (which *see*).

TAP-ROOTED. Having a large, simple, conical root, forming a centre round which the divisions are arranged.

TAR. Of late years, Tar has come to be regarded as a most valuable remedy against the ravages of many insects in gardens; and it is also used for the protection of farm crops. References have been made to it in treating of the remedies for insect attacks under the names of various plants; but it may be of use to give here a summary of the best methods of employing it.

As a preventive of attack, Tar is employed against such larvæ as conceal themselves underground during the day, and crawl up tree-trunks at night. It is also used to prevent the ascent of the females of the Winter Moths (*see* **Hybernia** and **Winter Moth**), and other

TRILLIUM GRANDIFLORUM.

Tar—*continued.*

female insects that cannot fly. These insects are thus prevented from reaching the leaf and flower-buds for egg-laying, and the trees are saved from destruction by the larvæ. The Tar may be applied directly on the bark, in a broad ring, mixed with an equal bulk of cart-grease, or with one-third part of fish-oil; the latter being added to prevent the Tar from losing its stickiness in frosty weather. On warm days, this mixture becomes fluid, and sinks into the bark; and trees with thin bark are liable to be injured by it. This difficulty may be overcome by placing a belt of straw-rope, or cloth, or strong paper, round the trunks that might be injured, and putting the Tar on the belt.

Tar-water and Spirits of Tar are also used as preventives; sand, well saturated with them, being laid round the base of each stem, to prevent the passage of insects to the plant. Tar-water is sometimes syringed over plants, as, in weak solutions, it is a good insecticide, and, by its smell, also deters insects from laying eggs on plants so treated.

Tar has been employed with great success for the capture of such insects as the beetles that devour Raspberries (*see* remarks on INSECTS under **Raspberry**), Turnips, and other plants, and also against such insects as Frog-hoppers. In America, it has proved itself the most effectual means of capturing the notorious Rocky Mountain Locusts. A light framework of wood is covered with thin wooden boards, cloth, or strong paper, so as to form a shallow tray, and the inside is smeared with Tar. The mode of using the trap varies with the insects to be caught. For catching Raspberry Beetles, and other insects on trees and bushes, the branches are beaten over the tray, and the insects fall into it, and are stuck in the Tar. Against the Turnip Flea, Grasshoppers, &c., the same method may be employed as against the Rocky Mountain Locusts, viz., dragging the tray along the ground, with something about 12in. or 18in. in front to disturb the insects, and to cause them to leap, when many of them fall into the Tar, and are held fast in it.

TARAXACUM (from *tarasso*, to disturb, to alter; from its supposed effects upon the blood). Dandelion. SYN. *Leontodon* (of Adanson). Including *Lasiopus*. ORD. *Compositæ*. A genus comprising, according to Bentham and Hooker, not more than half-a-dozen species of mostly hardy, nearly stemless herbs, broadly distributed. Flower-heads yellow, homogamous; ray florets ligulate, truncate at apex, five-toothed; involucre campanulate or oblong, the inner bracts one-seriate, the outer ones shorter and many-seriate; receptacle flat; achenes glabrous; scapes leafless, one-headed, or rarely branched at apex and two or three-headed. Leaves radical, entire, toothed, sinuate, or runcinate-pinnatifid. Only two species call for mention here. They thrive in ordinary soil, and may be increased by divisions. *T. officinale* is cultivated as a salad plant. For this purpose, seeds should be sown, in March or April, in drills 1ft. apart, or in a seed-bed, with a view to transplanting afterwards. All the after-attention necessary is that of an occasional hoeing between the plants. In the following spring, a quantity of new leaves will appear, and, in order to blanch them as they grow, the plants may be buried with sand, or covered with large, inverted flower-pots. The sand should be from 4in. to 6in. deep, and when the leaves show through it, they should be cut off at the crown and the sand placed over others. The plants should, of course, never be allowed to flower and ripen seeds in a garden.

T. montanum (mountain). *fl.-heads* one or two on a hairy scape; involucral bracts recurved and acute at apex. August. *l.* spreading, oblong, sub-runcinate, spiny-toothed, glabrous. Armenia, 1834. SYN. *Lasiopus sonchoides* (S. B. F. G. ser. ii. 346).

T. officinale (officinal). Common Dandelion. *fl.-heads* ½in. to 2in. broad, the outer ray florets often brown on the back; involucre

Taraxacum—*continued.*

FIG. 7. TARAXACUM OFFICINALE.

campanulate, the outer bracts recurved, the inner erect. March to October. *l.* oblong-obovate or spathulate, toothed, sinuate, or runcinate-pinnatifid. Root long, stout, black. Europe (Britain), &c. A well-known medicine. See Fig. 7. (Sy. En. B. 802.)

TARCHONANTHUS (from *Tarchon*, the Arabic name for *Artemisia Dracunculus*, and *anthos*, a flower; in reference to the resemblance of the flower-heads to those of *Artemisia Dracunculus*). African Fleabane. ORD. *Compositæ*. A small genus (three species) of small, greenhouse, tomentose, South African trees. Flower-heads small, sessile or shortly pedunculate, in axillary or terminal panicles; involucre of the male flowers of five scales, connate to their middle; those of the female of many separate scales, in a double row; receptacle hairy. Leaves alternate, petiolate, entire or lobed at apex, rather thick. The introduced species thrives in sandy, fibry loam, with the addition of a little leaf mould. Propagated by cuttings, inserted in sand, under a bell glass, in the beginning of summer.

T. camphoratus (camphor-scented). *fl.-heads* purple; females composed of three to five florets; panicle terminal, many-headed. June to October. *l.* lanceolate-oblong or obovate, acute at base, sub-acute or obtuse at apex, 3in. to 5in. long, entire or denticulate; young ones densely velvety above; old ones glabrous and reticulated above, tomentose below. *h.* 6ft. 1690. (L. B. C. 382.)

TARO. A native name for **Colocasia antiquorum** (which *see*).

TARRAGON (*Artemisia Dracunculus*). A perennial, native of Southern Europe, cultivated for the use of its aromatic leaves in seasoning, salads, &c., and in the preparation of Tarragon vinegar. The plant succeeds best in warm, rather dry situations, and a little protection should also be afforded the roots through the winter, as during severe frost they are liable to be injured. If green leaves are required during winter, a few roots should be lifted in autumn, and placed in heat; it will need but a small quantity to maintain a succession. The foliage may also be cut and dried in autumn for use in a dry state afterwards. Tarragon may readily be propagated by division in March and April, or by cuttings struck in a little warmth when growth is commencing in spring, or later in the summer, under a hand glass placed outside. A few young plants should be raised annually to keep up a supply.

TARTAREOUS. Having a rough, crumbling surface.

TASMANNIA. Included under *Drimys*.

TASTELESS MOUNTAIN CURRANT. *See* **Ribes alpinum.**

TAUSCHERIA (named in honour of Ignatius Frederick Tauscher, Professor of Botany at Prague, who died in 1848). ORD. *Cruciferæ*. A monotypic genus. The

Tauscheria—*continued.*

species is a small, erect, branched, hardy annual, inhabiting Central Asia and North India, and having small yellow flowers and entire leaves. It has no horticultural value.

TAVERNIERA (named in honour of J. B. Tavernier, 1605-89, a celebrated traveller in the Levant). ORD. *Leguminosæ.* A small genus (seven species have been described as such, but the number may be reduced to three or four) of greenhouse, canescent or glabrous undershrubs, natives of the East Indies and the Orient. Flowers pink or white, few in axillary, pedunculate racemes; calyx teeth sub-equal, or the two upper ones more remote; standard broadly orbicular, narrowed at base, scarcely clawed; bracts minute or caducous. Pods flattened, indehiscent. Leaves few, one-foliolate or pinnately trifoliolate; leaflets often obovate or orbicular; stipules scarious. Two species have been introduced. For culture, *see* **Desmodium.**

T. lappacea (Burdock-podded). *fl.* yellow, one or two together, axillary, on short pedicels. July and August. *fr.*, pods beset with stiff bristles, which are hooked at the apex. *l.* trifoliolate; leaflets fleshy, obcordate, villous. Stems procumbent, branched, divaricate, terete. Arabia Felix, 1820.

T. nummularia (Moneywort). East Indian Moneywort. *fl.* red, glabrous, ⅔in. to ½in. long; racemes few or many-flowered, usually exceeding the leaves. June and July. *l.* shortly petiolate, usually trifoliolate; leaflets ¼in. to 1in. long, obovate-oblong or nearly round, thick, thinly canescent beneath; stipules free. Branches copious. *h.* 1ft. to 2ft. India, Afghanistan, Orient, 1826.

TAWNY. *See* **Fulvous.**

TAXANTHEMA. A synonym of **Statice** (which *see*).

TAXEÆ. A tribe of *Coniferæ.*

TAXODIUM (from *Taxus*, the Yew, and *eidos*, resemblance; referring to the similarity in the leaves). Deciduous Cypress. SYNS. *Cuprespinnata, Glyptostrobus, Schubertia* (of Mirbel). ORD. *Coniferæ.* A small genus (three species) of ornamental, loosely-branched, hardy or half-hardy trees, natives of North America, Mexico, and China. Flowers monœcious; the males in compound, pyramidal spikes; the females two or three together near the spike of male flowers. Leaves deciduous or partly persistent, alternate, sub-spirally affixed, sometimes linear, distichous, and spreading, rarely small, appressed, scale-like. Cones hard, globose or ovoid; scales contracted and stipitate at base, woody at apex. Branchlets spreading or pendulous. The Deciduous Cypress is universally employed, throughout the United States, for making the best kind of shingles; and in Louisiana it is used for almost every other purpose to which timber can be applied. "The roots of large trees, particularly in situations subject to inundations, become covered with conical protuberances, commonly from 1½ft. to 2ft. high, and sometimes from 4ft. to 5ft. in thickness; they are always hollow. . . . They are made use of by the natives of the Southern States for beehives" (London). In England, however, these protuberances, or "knees," are rarely produced. Perhaps the specimen showing them most perfectly is in the Syon House gardens. Being semi-aquatic, positions on the banks of rivers, and amidst marshes and swamps, are highly suitable to *T. distichum.* All the species thrive in a moist soil. Propagation may be effected by cuttings, with the leaves intact, inserted in a vessel of water, where they will root in a few weeks; by layers; or by seeds.

T. distichum (two-ranked).* Bald, Black, Deciduous, or White Cypress. *fl.*, males in flexible, pendulous catkins; females in very small bunches. May. *l.* in two rows, flat, rather distant, pectinate, horizontally spreading, twisting at base, linear, tapering to a sharp point, ½in. long, one line broad, bright green, changing in autumn to dull red. *cones* rounded or roundish-ovate, about the size of a pigeon's egg; scales thick, dull brown. Branches stout, stiff, horizontal or ascending at the ends, the lateral ones rather pendulous; branchlets very slender, elegantly

Taxodium—*continued.*

pinnate. *h.* 120ft. United States, 1640. The following are varieties:

T. d. denudatum (denuded). Branches slender, long, horizontal or drooping towards the ends, irregularly and little divided; branchlets fringed with scattered, variable, unequally-distant leaves.

T. d. fastigiatum (pyramidal). *l.* two-rowed, resembling those of the species. Branches short, erect, slightly spreading at the top. A very distinct-looking, conical-pyramidal, small tree.

T. d. microphyllum (small-leaved).* *l.* shorter than in the type, distichous, somewhat imbricated, ovate-lanceolate. Branchlets erect, pendulous, or ascending. SYN. *Glyptostrobus pendulus* (B. M. 5603).

T. d. nanum (dwarf). Branches numerous, almost horizontal, short. This variety resembles the type, but is readily distinguishable by its very small dimensions, forming a very compact bush, 10ft. to 12ft. high.

T. heterophyllum (variable-leaved). Embossed Cypress. *l.* variable, alternate, some scale-formed, small, ovate, acute or obtuse, sometimes much longer, closely pressed and decurrent along the shoots, sometimes two-rowed, regularly tortuous, and almost awl-shaped, three to eight lines long. *cones* terminal, egg-shaped or oblong-cylindrical. Branches rising upwards and spreading at the summits; branchlets alternate. *h.* 8ft. to 10ft. China.

T. mexicanum (Mexican). A synonym of *T. mucronatum.*

T. mucronatum (mucronate-scaled). Montezuma Cypress. *l.* linear, pointed, nearly evergreen, two-rowed, straight, flat, tapering to a point, slenderer than in *T. distichum.* *cones* rather large, with the scales strongly mucronate. Branches spreading, slender. *h.* 120ft. Mexico. This species is too tender for the English climate; it may be readily distinguished from *T. distichum* by its sub-persistent leaves. SYN. *T. mexicanum.*

TAXUS (the old Latin name for the Yew, used by Virgil and Pliny, akin to Greek *Taxos* of Dioscorides). Yew. SYN. *Verataxus.* ORD. *Coniferæ.* A genus comprising six or eight species (probably varieties of one) of hardy, evergreen trees, rarely shrubs, broadly dispersed over North temperate regions. Flowers diœcious; males

FIG. 8. MONŒCIOUS BRANCHLET OF TAXUS BACCATA, showing—*m*, Clusters of Male Flowers; *f*, Fruits almost fully grown, with the arillus almost concealing the seed; *f′*, a Young Fruit, in which the arillus only half conceals the seed; *g*, Gall of Yew Gall-midge (*Cecidomyia Taxi*), consisting of the swollen terminal bud, resembling a cone of green leaves, among which the larvæ live.

solitary in the axils, sub-sessile; female catkins axillary, sessile, one (or very rarely two?) flowered. Fruit solitary, one-seeded. Leaves sub-spirally affixed, usually distichous-spreading, very shortly petiolate, linear, flat, often falcate. "The Yew is of geological antiquity; it formed part of the forests of Britain at a period long

Taxus—*continued.*

anterior to historic times. It is found among the buried trees on the Norfolk coast, near Cromer. It also "crops up in another forest, now beneath the Bristol

FIG. 9. BRANCHLET, WITH FRUIT, OF TAXUS BACCATA ADPRESSA.

Channel, in which, if there be any truth in bones, the elephant, rhinoceros, and beaver roamed" (G. C. n. s., vi., p. 99). The wood, which is hard and compact, but flexible and elastic, was in olden times in great request for the manufacture of bows. The branches are fre-

FIG. 10. TAXUS BACCATA DOVASTONI.

Taxus—*continued.*

quently tipped with galls of a Gall-midge (*Cecidomyia Taxi*). One of these is shown in Fig. 8. The female midge lays her eggs in the terminal bud of a twig; the larvæ hatch, and the result of their operations is the formation of a gall, which bears a strong resemblance to a cone in its form, and in the overlapping of the leaves of which it is composed. Among the leaves the small larvæ of the midge may be found. These galls are usually solitary; though two, or even three, may be found side by side at the tips of the twigs, the growth of which they check. They do not, however, inflict much injury on the trees. Should it be desired to get rid of the galls, they are so conspicuous that they can be readily detected and cut off. This should be done as soon as possible after their formation, while they still inclose the larvæ. Yews thrive in almost any soil. They are readily propagated from seeds, which should be sown in spring; the ripe fruits, after being gathered, should be mixed with sand and treated similarly to those of the Hawthorn until sowing time. Cuttings also afford a ready means of increasing any desirable form; these should be inserted in sandy soil, in August, and kept shaded under handlights, or in cold frames, during bright sun, until rooted. The golden varieties, and those of weeping habit, are frequently grafted on tall stems of the common upright type. Layering may also be advantageously resorted to.

T. baccata (berried). Common Yew. *fl.*, male catkins ¼in. long; females minute. March. *fr.* ⅓in. long, rounded, with a red, mucilaginous cup. *l.* linear, more or less falcate, acute, ⅓in. to 1½in. long, coriaceous, shining above, paler beneath. Trunk 15ft. to 50ft. high, sometimes as much as 27ft. in girth, channelled; branches spreading. Europe (Britain), India, &c. Tree. See Fig. 8. The following varieties are enumerated by Gordon, in "The Pinetum":

Taxus—*continued.*

T. b. adpressa (adpressed).* *fr.* li e that of the type, but somewhat smaller. *l.* oblong or bluntly oval, rounded at both ends on the lesser branchlets, but much longer and more pointed on those of the leading shoots, more or less distichous, flat, rather distant, on very short footstalks, decurrent, mostly spiny-pointed, two to four lines long, dark glossy-green above, glaucous below. Branches numerous, much divided, horizontally spreading, sometimes in whorls; lateral ones and branchlets distichous. *h.* 6ft. to 8ft. A dense, spreading, depressed bush, raised from seed in the nursery of Messrs. Dickson, of Chester, more than half a century ago. See Fig. 9. SYNS. *T. tardiva, Cephalotaxus tardiva.* There is a form, *erecta*, of upright habit.

T. b. argentea (silvery). *l.* striped with silvery-white, sometimes changing to straw-colour. A very handsome variety.

T. b. cheshuntensis (Cheshunt). This variety is intermediate between the type and *T. b. fastigiata.*

T. b. Dovastoni (Dovaston's).* Principal branches horizontal or pendent; branchlets quite drooping. A very striking variety. In the form *variegata*, all the leaves, when young, are broadly edged with golden-yellow, but, when fully matured, they change to a bright green, edged with silvery-white. See Fig. 10.

T. b. elvastonensis (Elvaston). *l.* on the young parts of the plant entirely of a bright orange-colour.

T. b. epacrioides (Epacris-like). *l.* light green, small. A pretty, dwarf, somewhat spreading variety.

T. b. erecta (erect).* Fulham Yew; Upright Common Yew. A slender variety, with smaller foliage than the type, but with a much stiffer and more erect habit. *Crowderi* is a form differing very slightly from this.

T. b. ericoides (Heath-like). *l.* dark green, very small. Twigs short, erect, slender. A slender, slow-growing variety, 1ft. to 2ft. high. SYN. *T. empetrifolia.*

T. b. fastigiata (pyramidal).* Irish or Florence Court Yew. *fr.* oblong. *l.* in tufts, or scattered along the branchlets, not two-rowed as in the type. Branches erect, closely compressed, forming a pyramidal or broom-shaped head. A very distinct and singular variety, of which the following are forms: *aurea variegata*, with golden-variegated leaves; *variegata*, having a portion of the foliage striped and margined with silvery-white or pale straw-coloured blotches.

T. b. Foxii (Fox's). *l.* much smaller and darker than in the type. A very dwarf kind, not exceeding 2ft. in height.

T. b. fructu-luteo (yellow-fruited).* *fr.* of a beautiful golden-yellow, very handsome.

T. b. glauca (glaucous). *l.* dark green above, bluish or glaucous-grey on the under part. Bark on the young shoots rusty-brown. A very vigorous kind.

T. b. Jacksoni. Jackson's Weeping Yew. *l.* light green, broad, all more or less incurved, falcate, and thickly covering the upper part of the branches. Branchlets reddish-brown, numerous, short, obliquely placed, and more or less curved. A nice, pendulous kind.

T. b. nana (dwarf). *l.* longer, and of a darker and more glossy-green, than those of the type. A very desirable variety, forming a dwarf, dense, conical bush.

T. b. nidpathensis (Nidpath Castle). A form rather columnar than pyramidal in habit, and having a tendency to spread at the top.

T. b. recurvata (recurved). *l.* longer and straighter than those of the species; the margins involute. Branches long and straggling, spread out and little divided, but often reflected.

T. b. sparsifolia (sparse-leaved). *l.* dispersed round the branches, as in the Irish Yew. Branches spreading.

T. b. variegata (variegated). *l.* mostly edged with golden-yellow. A very handsome variety. *Barroni* is a fine fruit-bearing form.

T. b. Wallichiana (Dr. Wallich's). *l.* deep glossy-green, much paler and not glossy below. Branches long, slender, spreading, light brown; branchlets more or less pendent. Gordon accords this specific rank.

T. brevifolia (short-leaved). Western or Californian Yew. *fr.* resembling that of the Irish Yew. *l.* distichous, flat, narrow, acute-pointed, somewhat curved on the branchlets, but more or less scattered on the leading shoots and principal branches, ¾in. to 1in. long, linear-falcate, rarely straight, glossy-yellowish-green, glaucous beneath, with a yellowish footstalk one line long. Branches slender, very long, pendulous, with yellowish bark. *h.* 30ft. to 40ft. California. A handsome tree. SYN. *T. Lindleyana.*

T. canadensis (Canadian). American Yew; Ground Hemlock. *fr.* resembling, but much smaller than, that of the common Yew. *l.* linear, crowded, rather narrow, mostly straight, somewhat distichous, revolute on the edges, decurrent at base, on very short footstalks, abruptly tapering at the apex, spiny-pointed, ¾in. to 1in. long, glossy, pale yellowish-green above, slightly rusty beneath. Branches slender, horizontally spreading, seldom ascending; branchlets distichous. *h.* 3ft. to 4ft. North America, 1800. A spreading bush.

Taxus—*continued.*

T. c. variegata (variegated). *l.* at the ends of the young shoots whitish; those lower down more or less margined with white; mature ones as in the type.

T. cuspidata (abrupt-pointed).* *l.* linear, curved upwards, alternate, stiff, scattered but somewhat distichous on the leading shoots, denser on the branchlets, ¾in. to 1in. long, on rather long footstalks, broadly decurrent at base, abruptly spine-pointed, deep glossy-green above, pale yellowish-green beneath, but not glaucous. Branches numerous, spreading; branchlets rather stiff, angular. *h.* 15ft. to 20ft. Japan. A large, handsome bush.

T. empetrifolia (Empetrum-leaved). A synonym of *T. baccata ericoides.*

T. Fortunei (Fortune's). A synonym of *Cephalotaxus pedunculata fastigiata.*

T. globosa (globular-seeded). Mexican Yew. *fl.* lateral and solitary on the under side of the branchlets. *fr.* with globular seeds. *l.* linear, slightly curved or falcate, narrow, closely placed, distichous, tapering to both ends, spiny-pointed, ¾in. to 1in. long, on rather long, twisted footstalks, decurrent at base, dark glossy-green above, very much paler beneath. Branches long, spreading, much divided; branchlets more or less drooping at the points, mostly forked. Mexico. A handsome, large bush or small tree.

T. Lindleyana (Lindley's). A synonym of *T. brevifolia.*

T. Makoya (Makoy's). A synonym of *Podocarpus chinensis.*

T. tardiva (tardy). A synonym of *T. baccata adpressa.*

T-BUDDING. Another name for Shield-budding, one of the principal methods adopted for propagating by budding. For the insertion of the bud, the stock is cut in a longitudinal direction, and then again transversely at the upper extremity of the cut, somewhat in the shape of the letter T. In Inverted T-budding the transverse cut is made at the lower instead of the upper end, thus ⊥, and the bud inserted from that point upwards. *See* **Budding.**

TEA BERRY, or **CANADA TEA.** *See* **Gaultheria procumbens.**

TEA, BOTANY BAY. *See* **Smilax glycyphylla.**

TEAK-TREE, AFRICAN. *See* **Oldfieldia africana.**

TEAK-TREE, INDIAN. *See* **Tectona grandis.**

TEAK-TREE, NEW ZEALAND. *See* **Vitex littoralis.**

TEA, PARAGUAY. *See* **Ilex paraguariensis.**

TEA-PLANT. *See* **Camellia theifera.** The name is also applied to many other plants.

TEASEL, TEAZEL, or **TEAZLE.** *See* **Dipsacus.**

TEATED. Resembling the figure of an animal's teat.

TECOMA (an abridgment of the Mexican name, *Tecomaxochitl*). Trumpet Creeper; Trumpet Flower. Including *Campsidium* and *Pandorea.* ORD. *Bignoniaceæ.* A genus embracing about two dozen species of stove, greenhouse, or hardy, erect and arborescent, twining, climbing, or radicant shrubs, dispersed over the warmer and sub-temperate regions of the globe. Flowers often fulvous, red, or orange, racemose or panicled at the tips of the branches; calyx tubular-campanulate, sub-equally five-toothed; corolla tube elongated, straight or incurved, sometimes slightly enlarged or sub-ventricose, sometimes dilated in an ample, campanulate throat; limb sub-bilabiate, the five lobes scarcely unequal, broad, erecto-patent or widely spreading; stamens four, didynamous, affixed below the middle of the tube, included or exserted. Capsule linear or narrowly elliptic, often acute at both ends, straight or incurved. Leaves opposite or rarely scattered, pinnate or undivided; leaflets often toothed. Tecomas succeed best in well-drained, loamy soil; they require very liberal supplies of water during summer, but should be kept moderately dry at the roots in winter. The plants grow vigorously under ordinary treatment; but, in order to insure their free flowering, the wood must be thoroughly ripened by being exposed to sunlight

Tecoma—*continued.*

and air during the period of growth. The stove species may be grown in heat all the summer, and ripened by being kept cooler in autumn. Those succeeding in a greenhouse may have plenty of light and air through the summer. *T. radicans*, when planted out of doors, should be trained to a wall with a south aspect. Propagation is effected by root-cuttings, by cuttings of the young or partially-ripened shoots, or by layering. A selection of the best-known species is given below. Several others, formerly included here, will be found under **Tabebuia**.

T. australis (Southern).* Wonga-Wonga Vine. *fl.* in loose, terminal panicles; corolla yellowish-white, tinged inside with purple or red, the tube ½in. to ⅔in. long, the lobes broad, not one-third as long as the tube. June. *l.*, leaflets usually five to nine, ovate-oblong to almost linear, entire or here and there coarsely crenate, variable, 1in. to 3in. long. Australia, 1793. A tall, woody, half-hardy climber. (B. 8.) SYNS. *T. diversifolia*, *Bignonia Pandorea* (A. B. R. 86; B. M. 865).

T. austro-caledonica (South Caledonian). *fl.* small; cymes opposite, compound; panicles terminal. Summer. *l.* imparipinnate, two or three-jugate, the upper ones trifoliolate; leaflets very broadly elliptic, obtuse, with two to four teeth below the acumen, sometimes nearly round. New Caledonia, 1870. A graceful climber.

T. capensis (Cape).* *fl.* clustered, in pedunculate racemes; corolla orange-scarlet, 2in. long, incurved; stamens exserted. August. *l.* imparipinnate, four-jugate; leaflets ovate, serrated. *h.* 15ft. Cape of Good Hope, 1823. A half-hardy, glabrous climber. (B. R. 1117; L. B. C. 1672.)

T. chrysantha (golden-flowered). A synonym of *Tabebuia chrysantha.*

T. diversifolia (variable-leaved). A synonym of *T. australis.*

T. filicifolium (Fern-leaved).* *l.* opposite, imparipinnate, 5in. long, including the petioles, bearing considerable resemblance to the fronds of some of the small, slender, pinnate Ferns; leaflets nine to twelve pairs, small, ovate, deeply cut into two or three lobes on each side, the larger lobes being sometimes also toothed. Stem slight, woody. Fiji Islands, 1874. A very elegant, stove climber. SYN. *Campsidium filicifolium* (F. & P. 1874, p. 280).

FIG. 11. FLOWERING BRANCH OF TECOMA RADICANS.

Tecoma—*continued.*

T. fulva (fulvous). *fl.* on bibracteate pedicels, seven to nine in a raceme; corolla fulvous outside, yellow within, 1½in. long. July. *l.* scattered, imparipinnate, multijugate; leaflets cuneate-ovate, sub-sessile, serrated at apex, villous when young, afterwards glabrous; petioles articulated. Branches terete, glabrous. *h.* 15ft. Peru, 1855. An erect, stove shrub. (B. M. 4896; F. d. S. 1116.)

T. grandiflora (large-flowered).* *fl.* in a terminal panicle; corolla scarlet, shorter and broader than that of *T. radicans*, the tube scarcely longer than the calyx; pedicels drooping, biglandular. July. *l.* imparipinnate; leaflets three to five-jugate, ovate, acuminate, with tooth-like serratures. *h.* 30ft. Japan and China, 1800. A glabrous, greenhouse climber. SYN. *Bignonia grandiflora* (A. B. R. 493; B. M. 1398; F. d. S. 1124-25).

T. jasminioides (Jasmine-like).* *fl.* in compact, terminal, corymbose panicles; corolla white, streaked with red in the throat, the tube above 1in. long, the very broad lobes more than ½in. long. August. *l.*, leaflets usually five or seven, ovate and acuminate or ovate-lanceolate, 1in. to 2in. long, all entire. *h.* 20ft. Australia. A glabrous, greenhouse climber. (B. M. 4004; B. R. 2002; P. M. B. vi. 199.)

T. mirabilis (wonderful). A garden synonym of *T. valdiviana.*

T. mollis (soft). *fl.* in a terminal panicle; corolla yellow or reddish. July. *l.* imparipinnate; leaflets four-jugate (in some forms, the upper leaves only one or two-jugate), oblong, acuminate, nearly entire, slightly serrated at apex, velvety on both sides. Branches compressed-terete. *h.* 6ft. Mexico, Colombia, Peru, and Chili, 1824. A softly pubescent-tomentose, erect, greenhouse shrub.

T. radicans (rooting).* Common Trumpet Flower. *fl.* in terminal corymbs; corolla scarlet-red, 2in. to 3in. long, the tube thrice as long as the calyx. Summer. *fr.* stipitate, 3½in. long. *l.* imparipinnate; leaflets four or five-jugate, ovate, acuminate, dentate-serrate, puberulous at the sides of the nerves beneath. *h.* 25ft. North America, 1640. A hardy shrub, climbing by aërial rootlets. See Fig. 11. SYN. *Bignonia radicans* (B. M. 485). The variety *minor* has narrower flowers of a beautiful scarlet colour.

T. rosæfolia (Rose-leaved). *fl.* in terminal, sub-spicate racemes; corolla yellow, glabrous, funnel-shaped. July. *l.* imparipinnate; leaflets bijugate, oblong, obtuse, serrated. Branches terete, somewhat striated. *h.* 6ft. South America. An erect, stove shrub.

T. sambucifolia (Elder-leaved). *fl.* in a terminal panicle; corolla yellow, funnel-shaped. July. *l.* imparipinnate; leaflets two or three-jugate, oblong, acuminate, serrated. Branches slightly compressed. *h.* 6ft. Peru, 1824. A glabrous, erect, stove shrub.

T. serratifolia (serrate-leaved). A synonym of *Tabebuia serratifolia.*

T. spectabilis (showy). A synonym of *Tabebuia spectabilis.*

T. stans (standing). Yellow Elder. *fl.* racemose or paniculate; corolla yellow, 1½in. long. Summer. *l.* imparipinnate; leaflets five to eleven, lanceolate, acuminate, deeply serrated. Branches terete. *h.* 12ft. West Indies and Mexico to Peru, &c., 1730. An erect, glabrous, greenhouse shrub. (B. M. 3191.)

T. s. apiifolia (Apium-leaved). *l.*, leaflets deeply incised, nearly pinnatifid. Mexico. Stove. SYN. *Bignonia incisa* (of gardens).

T. undulata (waved). *fl.*, corolla orange-coloured, ample, campanulate; racemes few-flowered, terminating the lateral branchlets. Summer. *l.* petiolate, simple, linear-lanceolate, obtuse, undulated, entire, often nearly alternate, 6in. to 7in. long; petioles nearly 1in. long. India and Arabia. A tall, erect, glabrous, stove shrub. SYN. *Bignonia undulata* (S. E. B. 19).

T. valdiviana (Valdivian). *fl.* four to nine in simple, terminal racemes; corolla orange-coloured, villous within towards the base. Spring. *l.* imparipinnate; leaflets nine to fifteen, ovate-oblong or elliptic, often mucronate, the margins toothed or nearly entire, pale beneath. Branches angular. Chili, 1870. A climbing, stove shrub. SYNS. *T. mirabilis* (of gardens), *Campsidium chilense* (G. C. 1870, 1182).

TECOPHILÆA (named after Tecophila, the daughter of Billotti, a botanist). SYNS. *Distrepta*, *Phyganthus*, *Pœppigia.* ORD. *Hæmodoraceæ.* A small genus (two species) of greenhouse, bulbous plants, natives of Chili. Flowers on rather long pedicels; perianth shortly and narrowly tubular above the half-inferior ovary, the lobes much longer, obovate-oblong, flat, sub-equal; scape included at base within a sheath with the leaves, otherwise leafless, one or loosely few-flowered. Leaves radical, few or solitary, spreading, linear or lanceolate, the base included in a long, scarious sheath. *T. cyaneo-crocea*, the only species yet introduced, thrives in a compost of

Tecophilæa—*continued.*

rich, sandy loam. The bulbs should be kept dry during their season of rest. Propagation may be effected either by seeds or by offsets.

T. cyaneo-crocea (blue-and-yellow). Chilian Crocus. *fl.*, perianth of a beautiful blue, with a whitish throat, 1¼in. to 1½in. long, the segments obovate, many-nerved; peduncles one to three, erect, simple, one-flowered, ebracteate, 1in. to 2in. long. *l.*, produced radical ones two or three, linear, acuminate, channelled, undulated, 3in. to 6in. long, ¼in. to ½in. broad. 1872.

T. c.-c. Regelii (Regel's). *fl.*, perianth segments narrower than in the type, 1in. long, oblong; peduncles longer. *l.* narrower, not undulated. (R. G. 718, under name of *T. cyaneo-crocea.*)

TECTONA (*Tekka* is the Malabar name of *T. grandis*). Teak. Syn. *Theca*. Ord. *Verbenaceæ*. A small genus (three species) of very valuable, lofty, stove, Asiatic timber-trees. Flowers white or bluish, small, in dichotomous cymes, forming an ample, terminal panicle; calyx campanulate, shortly five or six-cleft. Leaves opposite or ternately whorled, ample, entire. The wood of *T. grandis* (Indian Teak-tree) is very valuable, and is largely employed in ship-building. This species has been introduced to our stoves; but, as it reaches a height of 80ft. to 150ft., it is scarcely likely to find accommodation for its development in this country.

TEEDIA (called after J. G. Teede, a German botanist and traveller, who died in Surinam). Syn. *Borkhausenia*. Ord. *Scrophularineæ*. A small, South African genus (two species) of greenhouse, glabrous or pubescent shrubs. Flowers pink, rather small; calyx deeply five-cleft; corolla tube cylindrical, the limb of five short, rounded, sub-equal, spreading lobes; stamens four, didynamous; peduncles cymosely few-flowered in the upper axils, forming a terminal, leafy thyrse. Leaves opposite, entire. The species are rather pretty subjects when in flower. A light, rich soil is most suitable. Propagation may be effected by seeds, or by cuttings.

T. lucida (clear). *fl.*, corolla four to five lines long; peduncles ½in. to ¾in. long, three to seven-flowered. April. *l.* ovate or ovate-lanceolate, narrowed at base and embracing the stem, 1in. to 4in. long, clear-surfaced, acute, serrulated. Branches tetragonal. *h.* 2ft. 1774. Plant glabrous. (B. R. 209.)

T. pubescens (downy). *fl.*, corolla ½in. long. May. *l.* ovate or elliptic, often broader than those of *T. lucida*, rounded or narrowed at base, clasping the stem. *h.* 2ft. 1816. Plant rusty-pubescent or villous. (B. R. 214.)

TEESDALIA (named after Robert Teesdale, a Yorkshire botanist, author of "A Catalogue of Plants growing about Castle Howard"). Ord. *Cruciferæ*. A genus consisting of two species of glabrous, hardy, annual herbs, with minute, white flowers, and rosulate leaves. They are natives of Western Europe, the Mediterranean region, and Asia Minor. *T. nudicaulis* (Pepper Cress) is a common British weed.

TEETH. Any kind of small divisions.

TEGANIUM. A synonym of **Nolana** (which *see*).

TELANTHERA. Included, for garden purposes, under **Alternanthera** (which *see*). It is kept up as a distinct genus by Bentham and Hooker.

TELEGRAPH-PLANT. A common name for **Desmodium gyrans** (which *see*).

TELEIANTHERA. A synonym of *Telanthera*.

TELEKIA. Included under *Buphthalmum*.

TELEPHIUM (the old Greek name used by Hippocrates for a similar plant, perhaps named after Telephus, son of Hercules, by Auge). Orpine. Ord. *Ficoideæ*. A genus embracing one (or three) species of hardy, diffuse, often perennial herbs, inhabiting the Mediterranean region. Flowers white, small, in terminal, sub-capitate cymes; sepals, petals, and stamens five each. Leaves alternate, twin, or opposite, ovate or oblong, obtuse or acute, nerveless. *T. Imperati* (Tree Orpine) has been introduced, but is not worth cultivating.

TELFAIRIA (so called after Charles Telfair, 1778-1833, an Irish botanist, who died in the Mauritius). Syns. *Ampelosicyos, Joliffia*. Ord. *Cucurbitaceæ*. A small genus (two species) of stove, climbing shrubs, natives of tropical Africa. Male flowers mediocre or rather large, on bracteate pedicels, racemose; calyx tube short, the lobes lanceolate, serrated or crenate; corolla pale purple, rotate, five-parted, the segments fringed with elongated tendrils; stamens three. Female flowers solitary; rudimentary stamens wanting; ovary oblong, tumid and lobed at the base, three to five-celled. Fruit large, orbicular, compressed; seeds edible. Leaflets three or five, oblong, auricled at base, repand-toothed or cut. By pressure, the seeds of *T. pedata* yield an excellent bland oil, and they are said to be, when fresh, as palatable as almonds. Telfairias produce their handsome flowers in great profusion, but require a large space to grow in, and to be frequently pruned before flowering. Sandy loam and a little peat form a desirable compost for the plants. Cuttings of the flowering shoots should be taken, and inserted in soil or sand, under a glass, in heat, where they will readily root.

T. occidentalis (Western). *fl.* 1½in. to 2in. in diameter; corolla white, with a purple eye; stamens five; male racemes 1ft. long, six to ten-flowered. September. *fr.* yellow-green, 2ft. long, with ten thick wings 1in. deep, and flesh of golden-yellow pulp. *l.* alternate, petiolate, pedately five-foliolate; leaflets 3in. to 6in. long, shortly petiolulate, elliptic-ovate, obtusely acuminate, sinuate-toothed. Tendrils bifid. West Africa, 1870. (B. M. 6272.) Said to be cultivated for the seeds, which the negroes boil and eat.

T. pedata (pedate-leaved). *fl.* 1in. or more long; calyx downy, large; corolla purplish; male racemes six to eight-flowered; peduncles 6in. to 8in. long. July. *fr.* always green, 1½ft. to 3ft. long, often 8in. across, with ten to twelve deep furrows; seeds the size of a very large kidney bean. Zanzibar, 1825. (B. M. 2751-2.) Syns. *Feuillœa pedata* (B. M. 2681), *Joliffia africana.*

TELIPOGON (from *telos*, the summit, and *pogon*, a beard; the column is bearded to its summit). Syn. *Thelypogon*. Ord. *Orchideæ*. A genus embracing about forty species of stove, epiphytal Orchids, natives of the Andes of Columbia and Peru: it is doubtful, however, whether many of them are specifically distinct. Flowers few at the apex of the peduncle, loosely racemose, showy; sepals sub-equal, free, much spreading, narrow; petals much broader; lip sessile, much spreading, undivided, rarely small; column very short and thick, setose or hispid; pollen masses four; peduncles pseudo-terminal, rather long, erect, simple. Leaves distichous, short, coriaceous or fleshy. Only one species calls for description here. It does best in small baskets full of peat fibre, potsherds, and sphagnum, or attached to a piece of teak, with a little fresh sphagnum wired over the base of the plant.

T. Crœsus (Crœsus). *fl.* yellow, with a dark network, 1½in. in diameter; sepals triangular, acuminate, aristate, three-nerved, carinate outside on the middle nerve; petals cuneate, rhomboid, obtuse-angled, five-nerved; lip very broad, flabellate, rounded, many-nerved, the base velvety. *l.* distichous. Stems narrow and thin. Columbia, 1877.

TELLIMA (an anagram of *Mitella*, under which this genus was formerly included). Ord. *Saxifrageæ*. A genus embracing half-a-dozen species of hardy, erect, pilose or glandular, annual or perennial herbs, natives of North-west America. Flowers greenish or white, pedicellate, bracteolate, nodding; calyx tube ample, the limb five-toothed or five-cleft; petals five, rarely reddish, inserted at the mouth of the calyx, entire, trifid, or pinnatifid; stamens ten; racemes terminal, elongated, many-flowered. Leaves petiolate, roundish-cordate, lobed, toothed; stipules wanting, or adnate with the base of the petioles. *T. grandiflora*, the only species known to cultivation, is a handsome perennial. For culture, *see* **Mitella.**

T. grandiflora (large-flowered). *fl.* greenish, about ½in. long and broad; petals laciniate-pinnatifid, sessile; raceme somewhat spicate. April. *l.* palmately-lobed, cut-toothed; cauline ones

Tellima—*continued.*

similar, two to four, alternate; petioles somewhat stipuliform at base. Stem stout, about 2ft. high. 1826. Plant hirsute. (B. R. 1178.)

TELOPEA (from *telopas*, seen at a distance; alluding to the great distance from which the crimson flowers are discernible in its native country). SYN. *Hylogyne*. ORD. *Proteaceæ*. A genus comprising two or three species of tall, greenhouse shrubs, endemic in Australia. Flowers red, showy, on twin pedicels, densely racemose; perianth slightly irregular, the tube open early on the under side, tapering and recurved under the limb, the laminæ oblique, broad; racemes terminal, sub-globose or ovoid, surrounded by an involucre of imbricated, coloured bracts, the bracts within the raceme small. Follicles stipitate, oblique, recurved. Leaves alternate, entire or toothed. *T. speciosissima*, the only species yet introduced, is one of the most beautiful plants in the order to which it belongs. It requires a temperature rather warmer than that of an ordinary greenhouse; but a very moist atmosphere encourages a too vigorous growth, which is not conducive to floriferousness. Water may be applied freely in summer, but the roots should be kept nearly dry in winter. A well-drained border or bed of sandy loam is most suitable for the reception of this plant. Propagated by layering suckers during winter, in small pots, and allowing them to remain until rooted in the pots before being detached.

T. speciosissima (very showy). Waratah; Warratau. *fl.* crimson; perianth glabrous, about 1in. long; pedicels thick, recurved, ¼in. to ½in. long; head or raceme dense, about 3in. in diameter; involucral bracts ovate-lanceolate, the inner ones 2in. to 3in. long. June. *fr.* 3in. to 4in. long, containing ten to twenty seeds. *l.* cuneate-oblong or almost obovate, 5in. to 10in. long, mostly toothed in the upper part, tapering into rather long petioles, a few rarely quite entire. *h.* 6ft. to 8ft. 1789. (G. C. n. s., xvii., p. 677; B. M. 1128, under name of *Embotrium speciosissimum*.)

TEMPERATURE. A study of the ever-varying Temperatures daily experienced, and their effect on cultivated plants, forms an important part of the duties of every gardener who has under his charge anything beyond that which is of the hardiest description. Temperatures, it need scarcely be remarked, often fluctuate very suddenly from what is called one extreme to the other; and, as their guidance is beyond human control, it becomes a necessity on the part of cultivators to prevent such changes, so far as possible, from injuriously affecting plants, by giving constant attention, and anticipating what is likely to ensue. The degree of intensity of heat or cold is ascertained by the expansion or contraction of the mercury or spirit in a thermometer. From knowledge gained by experience, the extreme Temperatures that a large number of plants will withstand with impunity is often known, but there are exceptional cases where other conditions are unfavourable, and plants succumb in spite of all precautions. To know the Temperature in which various exotics succeed best, and the proper degree of heat requisite for bringing them to perfection, is one of the first essentials towards success. The maintenance of an equable Temperature in forcing operations, and in the culture of fruits under glass, is of great importance, as on it depends most materially the development of fruit or flowers, as the case may be. Forcing indoors is most intimately connected with, and dependent upon, the regulation of Temperature by means of the heating apparatus and the proper use of the ventilators when necessary. To know the country to which any given plant is indigenous, or to ascertain from a reliable source the degree of hardiness to which it may be subjected, is often a good guide in giving it proper treatment as regards the amount of heat required. But this is totally insufficient in dealing with the varied occupants of a large garden, and in conducting forcing operations in seasons when outside Temperatures often fluctuate very rapidly. Practical experience and unremitting attention are absolutely

Temperature—*continued.*

essential for good gardening, and, even when these are intelligently exercised in daily management, the operator finds there are many things beyond his control, sudden changes in the Temperature being amongst the most formidable.

TEMPLES. Architectural buildings, usually erected in extensive pleasure-grounds to form distinct, attractive features in themselves, and sometimes to afford resting-places or places of shelter. Temples found in many extensive gardens that have long been established, built of similar massive material, in proportion, to that of the mansion, are the best to imitate when this style of embellishment is desired. In any case, the material used should be of the most durable description; the shapes most generally adopted are circular, octagonal, and oblong. Occasionally, an elevated point or some position at the end of a walk will present itself, and appear to indicate the very place for a Temple, but these buildings need be, as a rule, but sparingly introduced. They are invariably expensive to erect.

TEMPLETONIA (named in honour of John Templeton, an Irish botanist). Including *Nematophyllum*. ORD. *Leguminosæ*. A genus embracing seven species of Australian, glabrous, greenhouse shrubs or under-shrubs, occasionally leafless. Flowers red or yellow, axillary, solitary or two or three together; two upper calyx lobes or teeth united or rarely distinct; standard orbicular or obovate, usually reflexed; wings narrow; stamens all united in a sheath open on the upper side; bracts usually very minute. Leaves (when present) alternate, simple, entire; stipules minute or spinescent. *T. retusa*, the only species introduced, is an interesting plant, thriving in a mixture of sandy loam and peat. It may be increased by young cuttings, inserted in sand, under a glass.

T. glauca (glaucous). A synonym of *T. retusa*.

T. retusa (retuse-leaved). Coral Bush. *fl.*, petals red or rarely white, 1in. to 1½in. long, all narrow, on short claws, and of nearly equal length; pedicels rigid, with obtuse bracteoles near the middle. March to June. *l.* broadly obovate to narrowly cuneate-oblong, less than ½in. to above 1in. long, obtuse, emarginate, or minutely mucronate, nearly sessile or shortly petiolate. *h.* 3ft. or more. 1803. (B. M. 2334; B. R. 383; L. B. C. 526.) SYN. *T. glauca* (B. M. 2088; B. R. 859; L. B. C. 644).

TENAGEIA. Included under *Juncus*.

TENARIS (said to be the native name in South Africa). ORD. *Asclepiadeæ*. A small genus (two species) of greenhouse, erect, slender, nearly simple, perennial herbs, natives of South Africa. Flowers pink or whitish, cymose; calyx deeply five-cleft, the lobes acute; corolla tube shortly campanulate, the lobes five, long, linear-spathulate; coronal scales ten, affixed to the new staminal tube; stamens affixed at the base of the corolla, the filaments connate in a short tube. Leaves opposite, narrow-linear. Only one of the species has been introduced. For culture, *see* **Ceropegia.**

T. rostrata (beaked). *fl.*, corolla whitish, densely covered towards the base with minute, purple dots, ¾in. in diameter, rotate; outer corona of five small, yellowish lobes; inner one of five pinkish segments; peduncles one (or two ?) flowered, three to five lines long. *l.* about four pairs, distant, linear, acute, 2in. to 3in. long, ⅛in. broad, arched. Stem 1½ft. high, slender. East tropical Africa, 1885.

TENDANA. A synonym of **Micromeria** (which *see*).

TENDRIL. The twisting, thread-like process by which some plants lay hold of others; *e.g.*, the Vine.

TENTHREDINIDÆ, or **SAWFLIES.** A family of **Hymenoptera** (which *see*), of very great interest to gardeners, because of the damage the insects do to various cultivated trees, shrubs, and herbs. The name Sawfly refers to the most characteristic feature of the

Tenthredinidæ—*continued.*

family, viz., the existence in the female of an organ, very like a minute double saw, at the hinder end of the body. The saw is a modified ovipositor, and is made up of two blades, each of which consists of a support along the back, and of the cutting portion, or saws strictly so called, secured to it along one side. The two saws are quite like one another. In each the edge is toothed, and has cross-bars, which are often furnished with minute teeth, and thus it combines the action of a saw with that of a file. The toothing and bars of the saws differ in the various species of Sawflies. They are protected, when not in use, in a two-jointed sheath. Sawflies, for the most part, have moderately broad bodies, with the abdomen united to the thorax by its full width; differing in this from most *Hymenoptera*, which have the abdomen fixed to the thorax by a slender stalk. The head is always broader than long, but is not broader

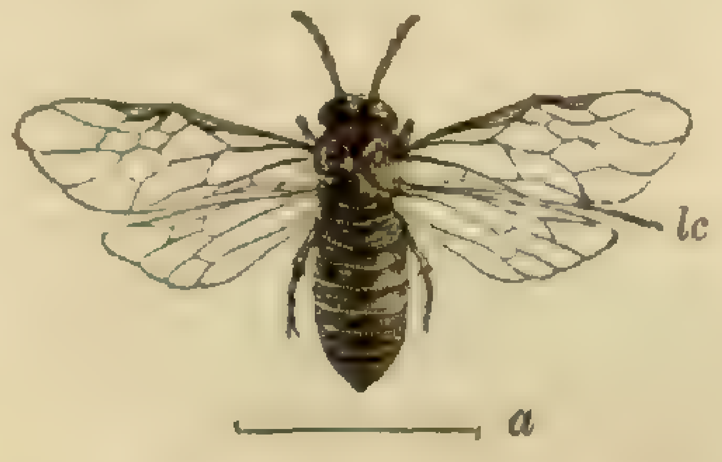

FIG. 12. ERIOCAMPA LIMACINA—*lc*, Lanceolate Cell in the Front Wings; *a*, Line showing the actual spread of Wings.

than the thorax. *Eriocampa limacina* (see Fig. 12) represents the majority of the group in form and general appearance. The body is usually smooth, sometimes hairy, and seldom marked with punctures. The colour is generally black or some dark shade, often with a metallic lustre; sometimes, it is coppery-green, blue, pure green, yellow, or red. The legs are often rusty-red, even when the body is some other colour; they are of fair size in proportion to the body, and have all their parts well developed. Each bears two sharp spurs near the tip of the tibia. The wings are of much the same structure as in other *Hymenoptera*; but the venation is characteristic in so far that one of the cells near the hind margin of each front wing, known as the "lanceolate cell" (*lc*, Fig. 12) is found in no other *Hymenoptera*. Generally, the wings are transparent, and more or less iridescent. The parts of the mouth are fitted for cutting vegetable structures.

FIG. 13. LARVÆ OF ROSELEAF SAWFLY.

There is usually a little difference in aspect between the sexes, due to slight modifications of the limbs, the body, and the organs of the head.

Sawflies abound from May till the end of July; and of some species a second brood appears in autumn. The mature insects are of sluggish habits, and, in dull weather, sit on the herbage, without change of position, for hours at a time. A few species are comparatively active, especially in bright weather. Sawflies frequent flowers, both to obtain honey or pollen, and to feed on the minute insects that are there found. They are partial to shallow, open flowers, *e.g.*, Buttercups and *Umbelliferæ*. The larvæ live on plants. The eggs are laid on leaves, frequently along the lower surface of the veins, or on twigs. In either case, the mother makes a slit for each egg with her saws. Many Sawflies have been found to be parthenogenetic, the females producing fertile eggs without the aid of the males, which, indeed, in some species are still unknown.

The habits of the larvæ vary greatly. Most of them feed exposed on the surface or edge of a leaf, some species

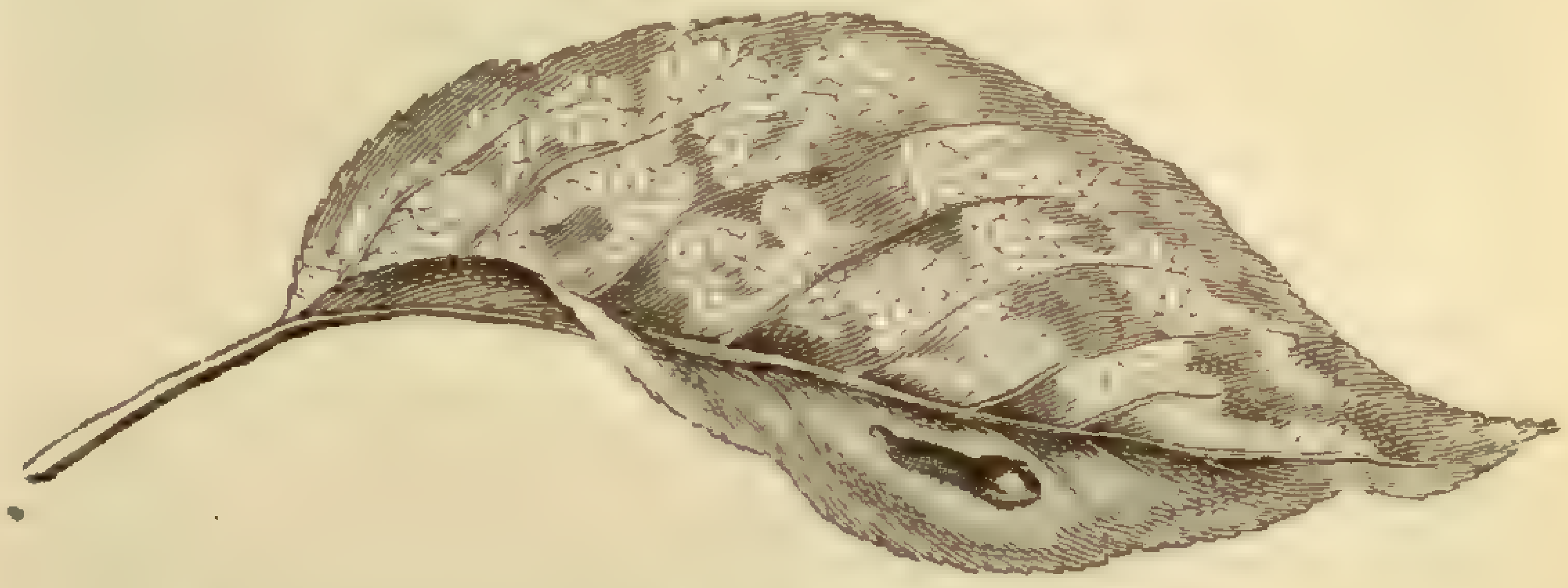

FIG. 14. SLUGWORM, THE LARVA OF ERIOCAMPA LIMACINA.

in groups, others singly (see Figs. 13 and 14). Some (*Lyda*) spin silken webs, in which many live, each larva in its own tube, sheltered in the common web. A few live in leaves rolled or folded by themselves to afford them protection. Others bore into twigs. Some are leaf-miners, and others burrow into fruits. A considerable number of species make galls in stems or leaves; many of the gall-makers abound on Willows. The forms of the larvæ vary with their modes of life; but by far the most species have a cylindrical body. A very common position, when at rest or feeding, is to have the front half of the body straight, and the hinder segments rolled spirally inwards (see Fig. 13). In general appearance, the larvæ closely resemble those of many Night Moths, or *Noctuæ*, having, like these, three pairs of true legs, and several pairs of prolegs; but they differ in the number of the latter, often having from six to eight pairs, instead of five pairs, as in *Noctuæ*, and the fifth segment always bears prolegs (if any exist) in Sawfly larvæ, but never in the larvæ of the *Noctuæ*. Sawfly larvæ are protected by their inconspicuous form and colour, or by dropping to the ground, if danger threatens, or by disagreeable excretions on the surface of the body. Some, *e.g.*, Slugworms (see Fig. 14), excrete slimy substances, others bear a flaky coating, &c. Brightly-coloured kinds are mostly protected by disagreeable excretions. Most of them pupate in silken or earthen cocoons, under soil, in crevices, or in other sheltered places.

The more injurious species of Sawflies, and the remedies most effectual against each, will be found discussed at greater length under the following heads: **Gooseberry and Currant Sawfly, Lophyrus, Lyda, Nematus, Pine Sawflies, Slugworms,** and **Turnip Sawfly**.

TENTHREDO CERASI. An old name for *Eriocampa limacina*. *See* **Slugworms.**

TENTHREDO GROSSULARIÆ. A name formerly given to the **Gooseberry and Currant Sawfly** (which *see*).

TEPHRITIS ONOPORDINIS. *See* **Celery Fly.**

TEPHRO. A term which, used in Greek compounds, signifies ash-grey.

TEPHROSIA (from *tephros*, ash-coloured; alluding to the colour of the leaves). North American Hoary Pea. Including *Requienia*. ORD. *Leguminosæ*. A large genus (about ninety species) of stove, greenhouse, or half-hardy herbs, sub-shrubs, or rarely shrubs, broadly dispersed over the warmer regions of the globe. Flowers red, purple, or white, in leaf-opposed racemes, or solitary or in pairs in the axils; calyx tube campanulate, the teeth distinct, sub-equal; petals clawed; standard sub-orbicular; keel incurved, not beaked; stamens diadelphous. Pods flattened, two-valved. Leaves usually odd-pinnate; leaflets opposite, often silky beneath. Several of the species are economically valuable, but few of them are very ornamental. A selection from those introduced is here given. All thrive in a compost of sandy peat and leaf mould. Propagation may be readily effected by seeds; or by cuttings, inserted in sand, under a bell glass, those of the stove species in heat.

T. candida (whitish). *fl.* reddish or white, ¾in. to 1in. long; standard densely silky; racemes copious, terminal and lateral, elongated, 6in. to 9in. long. July. *l.* shortly petiolate, 6in. to 9in. long; leaflets nineteen to twenty-five, ligulate, acute, 1½in. to 2in. long. India, 1816. A low, stove shrub.

T. capensis (Cape).* *fl.* purple, ¼in. long, the standard pubescent; racemes interrupted, attenuated, distantly many-flowered; peduncles elongated, slender. July. *l.* rather long-petiolate; leaflets three to six pairs, elliptic, cuneate-oblong, or lanceolate, obtuse or acute. Stems procumbent or trailing, 2ft. to 3ft. long. South Africa, 1825. Greenhouse sub-shrub.

T. grandiflora (large-flowered). *fl.* red, fulvescent on the outside, eight to ten lines long; peduncles terminal and leaf-opposed, fasciculate-corymbose at summit. June. *l.* shortly petiolate; leaflets five or seven pairs, cuneate or linear-oblong, obtuse or acute, retuse or mucronulate. *h.* 1ft. to 2ft. South Africa, 1774. An erect, greenhouse shrub. (B. R. 769, under name of *Galega grandiflora*.)

T. pallens (pale). *fl.* pink, four to five lines long, the standard pubescent, the other petals glabrous; racemes dense, many-flowered; peduncles curved, 4in. to 6in. long. July. *l.* shortly petiolate, very spreading or recurved; leaflets five to nine pairs, narrow, cuneate-oblong, ¾in. long, recurved-pointed. South Africa, 1787. An erect or ascending, greenhouse sub-shrub.

T. purpurea (purple). *fl.* pale red, ¼in. to ⅜in. long, silky; racemes copious, elongated, all leaf-opposed, 3in. to 6in. long, loose, the lower flowers fascicled. July. *l.* shortly petiolate, 3in. to 6in. long; leaflets thirteen to twenty-one, narrow-oblanceolate, obtuse, glabrescent above, obtusely silky beneath. *h.* 1ft. to 2ft. Throughout the tropics, 1768. Stove perennial.

T. suberosa (slightly bitten). *fl.* pink; vexillum with a very short, callous claw, broadly oval; peduncles terminal and axillary, racemose, shorter than the leaves. July. *l.* shortly petiolate, 4in. to 6in. long; leaflets 1in. to 1½in. long, oblong-lanceolate or lanceolate, very pale, silky-canescent. *h.* 4ft. South Africa, 1818. Greenhouse shrub.

T. virginiana (Virginian).* *fl.* yellowish-white, marked with purple, large and numerous, clustered in a terminal, oblong, dense raceme or panicle. June and July. *l.*, leaflets seventeen to twenty-nine, linear-oblong. Stem erect and simple, 1ft. to 2ft. high, leafy to the top. North America, 1765. Half-hardy perennial.

TERAMNUS (from *teramnos*, soft; in reference to the pods and leaves). SYN. *Glycine* (of Wight and Arnott). ORD. *Leguminosæ*. A small, tropical genus of slender, twining, stove herbs. Flowers small, fascicled or racemose; standard ovate, narrowed at base, exappendiculate. Leaves pinnately trifoliolate, stipellate. Two species have been introduced, but they are not very ornamental, and are probably no longer in cultivation.

TERATOPHYLLUM. Included under *Acrostichum*.

TEREBINTH-TREE. A common name for **Pistacia Terebinthus** (which *see*).

TEREBINTHUS. A synonym of **Pistacia** (which *see*).

TEREDO. Any disease in plant life caused by the boring of insects.

TERETE. Free from angles; cylindrical or nearly so; tapering.

TERGEMINATE. "When each of two secondary petioles bears towards its summit one pair of leaflets, and the common petiole bears a third pair at the origin of the two secondary petioles; as in *Mimosa tergemina*" (Lindley).

TERMINAL. Proceeding from the end.

TERMINALIA (from *terminus*, end; alluding to the disposition of the leaves). Myrobalan-tree. Including *Badamea*, *Buceras*, *Bucida*, *Catappa*, *Fatræa*, *Myrobalanus*, and *Pentaptera*. ORD. *Combretaceæ*. A large genus (eighty to ninety species) of stove, evergreen, erect shrubs or trees, broadly spread over the tropics. Flowers green or white, rarely coloured, small, sessile, in spikes or heads; calyx five-toothed or five-cleft; petals wanting; stamens ten, biseriate. Leaves alternate, rarely nearly or quite opposite, often clustered at the tips of the branches, often stalked and entire. A few of the introduced species are here described. The bark of *T. Buceras* is greatly esteemed by tanners. Loam and peat form the most suitable compost for these plants. Propagation may be effected by cuttings, inserted in sand, and plunged in heat, under a glass. With the exception of *T. sericea*, all the species here described are trees

T. angustifolia (narrow-leaved). A synonym of *T. Benzoin*.

T. Arjuna (Arjuna). *fl.*, spikes usually panicled. *l.* sub-opposite, oblong or elliptic, usually 4in. to 6in., sometimes 10in., long, suddenly narrowed at base, often cordate, obtuse or very shortly acute at apex, nearly glabrous beneath when old; petioles rarely more than ¼in. long, with two glands near the apex. *h.* 60ft. to 80ft. India. (B. F. S. 28.) SYN. *Pentaptera Arjuna*.

T. Benzoin (Benzoin). *fl.*, racemes axillary, pedunculate, as long as the leaves. *l.* crowded at the thickened tips of the branches; oblong-lanceolate, crenate, obtuse or cuspidate, glabrous, sub-coriaceous, 3in. to 4in. long, narrowed into glandular petioles. *h.* 30ft. to 40ft. Mauritius, 1824. A milky juice is said to flow from this tree, which, when dried, is used as incense in Mauritius. SYNS. *T. angustifolia*, *T. mauritiana*.

T. Buceras (Buceras). *fl.* rather distant; spikes cylindrical, silky or villous-pubescent. *l.* variable, obovate or spathulate-lanceolate, glabrous above, silky and glabrate beneath. *h.* 20ft. to 30ft. West Indies, 1793. A monstrosity of the flowers, transformed into long, cylindrical, arcuate bodies, is peculiar to this species. SYN. *Bucida Buceras* (B. R. 907).

T. Catappa (Catappa). Olive Bark-tree; Malabar Almond-tree. *fl.* in short-peduncled, slender, spike-like, axillary racemes. *l.* crowded near the ends of the branchlets, shortly petiolate, obovate, obtuse, entire, membranous, 6in. to 12in. long, glabrous or pilose beneath, with two glands near the base of the midrib. *h.* 60ft. to 80ft. Tropical Asia, &c., 1778. (B. M. 3004.)

T. Chebula (Chebula). Negroes' Olive-tree. *fl.*, spikes terminal, often panicled. *l.* not clustered, often sub-opposite, ovate or elliptic, usually acute and rounded at base, 4in. to 5in. long, more or less hairy when young; petioles about 1in. long, often with two glands near the summit. *h.* 80ft. to 100ft. India, 1796. (B. F. F. 29; B. F. S. 27.)

T. latifolia (broad-leaved). *fl.*, spikes simple, pedunculate, cylindrical. *l.* approximate at the tips of the branches, obovate-oblong, 6in. to 12in. long, glabrate or pubescent beneath, tapering into petioles 1in. long, often with small glands or tufts of hair in the vein-axils beneath. *h.* 80ft. to over 100ft. West Indies, &c., 1800.

T. mauritiana (Mauritian). A synonym of *T. Benzoin*.

T. sericea (silky). *fl.*, spikes silky, pedunculate, shorter than the leaves. *l.* alternate, crowded at the tips of the branches, oblong or obovate-oblong, 2½in. to 3in. long, mucronulate, quite entire, clothed with silky, appressed hairs on both surfaces, narrowed into short petioles. *h.* 6ft. and upwards. South Africa, 1816. Shrub.

TERMINALIS. A synonym of *Dracæna*.

TERNATE. A whorl of three; three things in opposition round a common axis; *e.g.*, a leaf consisting of three leaflets.

TERNATEA. Included under *Clitoria*.

TERNATELY-DECOMPOUND. Compound in a ternate manner.

TERNATELY-VERTICILLATE. Having three leaves in a whorl.

TERNSTRŒMIA (named after Christopher Ternstrœm, a Swedish naturalist and traveller in China, who

Ternstrœmia—*continued.*

died in 1745). SYN. *Taonabo.* Including *Reinwardtia* (of Korthals). ORD. *Ternstrœmiaceæ.* A genus comprising about twenty-five species of stove, evergreen trees or shrubs, of which five or six are found in the warmer parts of Asia and the Indian Archipelago, and the rest in tropical America. Sepals five, closely imbricated; petals five, imbricated, connate at base; stamens indefinite, adnate to the base of the corolla; peduncles one-flowered, recurved, axillary or lateral, solitary or sub-fasciculate, bibracteolate. Leaves coriaceous, entire or crenate-serrate. A selection of the few introduced species is given below. All are shrubs. They thrive in well-drained, fibrous loam, and are readily propagated by cuttings of the half-ripened young shoots, inserted under a bell glass, in bottom heat.

FIG. 15. FLOWERING BRANCH OF TERNSTRŒMIA ELLIPTICA.

T. elliptica (elliptic-leaved). *fl.* white; sepals rounded; peduncles drooping. July. *l.* variable, spathulate or elliptic, 3in. long, rather blunt, quite entire, obsoletely veined. *h.* 6ft. West Indies, 1818. See Fig. 15. SYN. *T. peduncularis.*

T. peduncularis (pedunculate-flowered). A synonym of *T. elliptica.*

T. sylvatica (sylvan). *fl.* white; petals not lined; anthers apiculate; bracts ovate, acute, under the calyx. July. *l.* lanceolate, obtusely acuminate. Branches smooth. *h.* 2ft. Mexico, 1840.

T. venosa (veined). *fl.* white; pedicels aggregate, axillary, a little shorter than the petioles. June to August. *l.* oblong, serrulated, veined. *h.* 6ft. Brazil, 1824.

TERNSTRŒMIACEÆ. A natural order of trees and shrubs, rarely climbing, mostly inhabiting tropical America and Eastern Asia. Flowers regular, hermaphrodite or rarely diclinous, showy or mediocre, rarely small; petals five, rarely four, six, or seven, free or shortly coalescing at base, the inner ones often larger; petals five, rarely four or six to nine, hypogynous, free or often coalescing at base in a ring or short tube, imbricated or twisted; stamens usually numerous; anthers basifixed and erect, or versatile, two-celled; disk none; ovary free; peduncles axillary, one or many-flowered, or the flowers in terminal, axillary racemes, rarely disposed in elongated panicles; bracteoles under the calyx often two. Fruit sometimes fleshy, coriaceous, or slightly woody and indehiscent, or a loculicidal or septicidal, dehiscent capsule. Leaves alternate or very rarely opposite, simple and undivided, or rarely digitately three to five-foliolate, entire or often serrated, coriaceous or rarely membranous, penninerved; stipules wanting or very rarely minute and highly caducous. The most important economical product of this family is Tea, *Camellia theifera* (= *Thea chinensis*). Although two centuries have not passed since Tea was first used in Europe, the annual importation now exceeds twenty-two millions of pounds. The order comprises about thirty-three genera and 260 species. Examples: *Camellia, Caryocar, Freziera, Ternstrœmia.*

TERPNANTHUS. A synonym of **Spiranthera** (which *see*).

TERRACE. A raised space of ground, sometimes formed round a mansion, or on the side of sloping ground, usually for the purpose of making a level walk. In some cases, it is necessary to have some arrangement of this sort; but, in many other instances, after having been made at great cost, Terraces have been found most objectionable, because of the walls interfering with views of landscape from the mansion, and also preventing the latter from being seen to advantage when approaching it. A Terrace retained in position by a strongly-built wall, on which flower-vases, &c., are fixed, is more likely to constitute a double block of this sort than when a sloping grass bank is substituted; if the latter can be arranged, it is, therefore, to be preferred when the formation of a Terrace is really necessary. A Terrace-walk may sometimes be introduced with advantage on rising ground, where an exceptionally good view is at command, that cannot, perhaps, be seen from elsewhere; but the formation of Terraces as architectural features, apart from the necessity of having them, often assists, if it does not entirely succeed, in destroying beautiful landscape. The advantages and disadvantages should, therefore, receive full consideration.

TESSARIA (named after Luis Tessari, Professor of Botany, &c., at Ancona, writer of works on "Materia Medica"). SYNS. *Gynheteria*, of Willdenow (*Gyneteria* of Sprengel), *Phalacromesus, Polypappus.* ORD. *Compositæ.* A small genus (five species) of hardy, Western American shrubs. Flower-heads small, cymose, sometimes disposed in an ample corymb; involucral bracts many-seriate; ray florets purplish, pale on the outside. Leaves alternate, entire or toothed. Probably none of the species are now cultivated in this country.

TESSELLATED. Chequered; when colours are disposed in small squares.

TESTA. The skin or integument of a seed.

TESTACELLA (a diminutive of *testa*, a shell; in allusion to the small size of the shell). A genus of Slugs which must be regarded as beneficial in gardens, inasmuch as they feed exclusively on earthworms, following them into their burrows. The body is long and

Testacella—*continued.*

slender, so as to pass easily along the burrows. On the hinder part of the back is a small, depressed, ear-shaped shell, about ¼in. long, which protects the rear of the animal when in the burrows. This external shell at once distinguishes these animals from the true Slugs, which do mischief in gardens. Two species are known in England.

T. haliotidea is dirty-yellow, with brown specks, rarely pale yellow, sometimes entirely black; when extended, it is about three inches long. It is said to swallow the worms alive. This species is known to occur in many localities in the South of England, and has been found as far north as Kirkcaldy, in Fifeshire.

T. Maugei is a native of South-west Europe, but has naturalised itself near Bristol. It is dark brown, and the shell is larger than in *T. haliotidea.*

TESTACEOUS. Brownish-yellow; resembling unglazed earthenware in colour.

FIG. 16. TESTUDINARIA ELEPHANTIPES.

TESTUDINARIA (from *testudo*, a tortoise; alluding to a supposed resemblance in the outside roots). ORD. *Dioscoreaceæ.* A small genus (two species) of greenhouse twiners, endemic in South Africa. Flowers diœcious, small, racemose in the axils, resembling those of *Dioscorea.* Leaves alternate, caudate or sub-deltoid. *T. elephantipes,* the species best known to cultivators, is an interesting plant, succeeding well in thoroughly-drained, sandy loam. During the period of rest, it should be kept dry. Increased by imported roots.

T. elephantipes.* Elephant's Foot; Hottentot Bread; Tortoise-plant. *fl.* greenish-yellow, sometimes dark-spotted, rather long-pedicellate; male racemes axillary, solitary, 1¼in. to 1¾in. long, simple, sometimes simply branched below; females axillary, solitary, pedunculate, few-flowered, scarcely 1in. long. July. *l.* broadly cordate-ovate, sub-reniform, with a stout mucro, seven to nine-nerved, complicated. *h.* 10ft. 1774. See Fig. 16. (B. R. 921; B. M. 1347, under name of *Tamus elephantipes.*)

TETA. A synonym of **Peliosanthes** (which *see*).

TETRA. This term, used in Greek compounds, signifies four: *e.g.,* Tetrapyrenus, four-stoned.

TETRACARPUM. A synonym of **Schkuhria** (which *see*).

TETRACERA (from *tetras*, four-fold, and *keras*, a horn; alluding to the curved shape of the four capsules). SYNS. *Euryandra, Wahlbomia.* ORD. *Dilleniaceæ.* A genus including about two dozen species of glabrous or scabrous-pubescent, stove, climbing shrubs or rarely trees, dispersed over tropical regions. Flowers paniculate; sepals four to six, spreading; petals equalling the sepals in number, or rarely fewer; carpels three to five (rarely one or two?). Leaves parallel-penniveined. The few species introduced, having no recommendation beyond their botanical features, are probably lost to cultivation.

TETRACHOTOMOUS. When a stem ramifies in fours.

TETRADENIA (of Nees). Included under **Litsea** (which *see*).

TETRADIUM (from *tetradeion*, a quaternion; the parts of flowers and fruit are in fours). ORD. *Rutaceæ.* A monotypic genus, now included, by Bentham and Hooker, under *Evodia.* The species is a stove, evergreen tree, requiring culture similar to **Brucea** (which *see*).

T. trichotomum (trichotomous-racemed). *fl.* whitish, disposed in large, sub-terminal, trichotomous panicles; calyx short, four-parted; petals four, longer than the calyx; stamens four. April and May. *l.* smooth, imparipinnate; leaflets quite entire. *h.* 20ft. Cochin China, 1822. The proper name of this species is *Evodia fraxinifolia.*

TETRADYNAMIA. A Linnean class, characterised by the flowers being tetradynamous.

TETRADYNAMOUS. "Having six stamens, of which two are longer than the four others, which stand in pairs on opposite sides of an ovary; as in Crucifers" (Lindley).

TETRAGASTRIS. A synonym of **Hedwigia** (which *see*).

TETRAGONAL. Four-angled.

TETRAGONIA (from *tetra*, four, and *gonia*, an angle; alluding to the fruit). SYN. *Demidovia.* ORD. *Ficoideæ.* A genus comprising about a score species of greenhouse or hardy, prostrate or somewhat climbing herbs or sub-shrubs, mostly South African, a few being also found on the shores of Eastern Asia, Australia, and temperate South America. Flowers green, yellowish, or reddish, axillary, solitary or few, sessile or on long pedicels, sometimes sub-spicate; calyx lobes three to five; petals none. Leaves alternate, oblong, linear, ovate, or deltoid, entire, rather thick; stipules absent. *T. expansa,* the only species calling for description here, is grown in gardens as a substitute for summer Spinach. For culture, &c., see **New Zealand Spinach.**

T. expansa (expanded). New Zealand Ice Plant; New Zealand Spinach. *fl.* yellow, small, on very short pedicels or almost sessile in the axils, solitary or twin. *l.* petiolate, the larger ones

Tetragonia—*continued.*

Fig. 17. Branchlet of Tetragonia expansa.

ovate, triangular, or broadly hastate, 2in. to 4in. long, entire, obtuse or acute, the smaller ones narrower. Australia, New Zealand, &c. Plant hardy, decumbent or prostrate, often extending to several feet. See Fig. 17. (B. M. 2362.)

TETRAGONIACEÆ. Included under *Ficoideæ.*

TETRAGONOLOBUS. Included under **Lotus** (which *see*).

TETRAGONOTHECA (from *tetragonos*, quadrangular, and *theke*, a case; alluding to the four-angled grains). Ord. *Compositæ.* A small, North American genus (three species) of tall, erect, hardy, perennial herbs. Flower-heads yellow, rather large, solitary or loosely corymbose, heterogamous; ray florets ligulate, spreading; involucre explanate, with four bracts in one series; achenes thick, triangular, glabrous or slightly pilose. Leaves opposite, amplexicaul, deeply toothed or incised-pinnatifid. Only one species has been introduced. It is an interesting plant, thriving in any light, rich soil. Propagation may be effected by divisions, or by seeds.

T. helianthoides (Sunflower-like). *fl.-heads* pale yellow, large, pedunculate, terminating the branches; involucre 2in. or more in diameter. August. *l.* 3in. to 6in. long, repandly and unequally toothed, or with coarse, sharp, salient teeth. Stem 2ft. to 3ft. high, terete. 1726.

TETRAHIT. A synonym of **Galeopsis** (which *see*).

TETRAHITUM. A synonym of **Stachys** (which *see*).

TETRAMERIUM. A synonym of **Faramea** (which *see*).

TETRAMICRA (from *tetra*, four, and *micros*, small; in allusion to the four smaller divisions of the anther). Including *Leptotes.* Ord. *Orchideæ.* A genus including about half-a-dozen species of stove, terrestrial or epiphytal orchids, natives of tropical America, from Brazil to the West Indies. Flowers mediocre, pedicellate; sepals and petals sub-equal, free, spreading; lip affixed to the base of the column, free, spreading, the lateral lobes shortly clawed, the middle one broad, entire; column erect, broadly two winged above or from the base; raceme simple, loose; peduncle terminal, elongated, slender, rigid. Leaves linear, fleshy, semi-terete or

Tetramicra—*continued.*

very short and thick. Stems leafy, scarcely thickened, not pseudo-bulbous. The best-known species are here described. They thrive under conditions which suit *Sophronitis.* They may be grown on blocks of Tree-fern stem with a little sphagnum round the collar of the plant, or in baskets of fibrous peat, sphagnum, potsherds, and a few pieces of charcoal, intermixed. Cool treatment best suits the species described below, and all like a light place; they do well when suspended near the roof of the cool Orchid house. They are propagated by division.

T. bicolor (two-coloured). *fl.* solitary; sepals and petals white linear-oblong; lip having two very short lateral lobes, and an oblong front lobe nearly as long as the petals, white, streaked with purple on the disk; ovary very long, pedunculiform. Winter. *l.* solitary, terminating the stems, terete, recurved, fleshy, grooved above. Rhizome creeping, throwing up several slender stems about 1in. long, almost cylindrical. Brazil, 1831. Syn. *Leptotes bicolor* (B. R. 1625), *L. b.* var. (B. M. 3734).

T. rigida (rigid). *fl.*, sepals and petals greenish; lip rosy, purple-striped, exserted, the lateral segments spreading, the middle one roundish-obovate, large; scape distantly sheathed, few-branched above or simple. March. *l.* few, 4in. to 8in. long, half-cylindrical, linear, channelled, acuminate, recurved. *h.* 1ft. to 2ft. West Indies. Plant rigid. Syn. *Brassavola elegans* (B. M. 3098).

T. serrulata (serrulated). *fl.* as in *T. bicolor*, but three or four times larger; lip white, with lines of brilliant lake radiating from the base, where it has two short, rounded auricles; scapes terminal, axillary, purple. April and May. *l.* cylindrical, fusiform, grooved, glaucous-green, dotted with purple. Stems sometimes two-leaved. Brazil. Syn. *Leptotes serrulata* (L. S. O. 11).

TETRANEMA (from *tetra*, four, and *nema*, a filament; the genus is characterised by having four stamens). Ord. *Scrophularineæ.* A monotypic genus. The species is a pretty, dwarf, perennial, greenhouse herb. In spring, it should be potted in a compost of leaf mould and sandy loam, and placed in the greenhouse, where it will bear a profusion of flowers during the greater part of the summer. The atmosphere of a warm greenhouse is necessary during winter. Propagation may be effected by seeds, or by divisions.

Fig. 18. Tetranema mexicana, showing Habit and detached Flower.

T. mexicana (Mexican). Mexican Foxglove. *fl.* shortly pedicellate, on axillary, scape-like peduncles; calyx five-parted; corolla purplish-violet, variegated with a paler colour; stamens four. *l.* sub-radical, opposite, obovate or oblong, loosely crenate-toothed, angled at base, glabrous. Stems very short, or in cultivation slightly elongated and ascending. Mexico, 1843. See Fig. 18. (B. H. 1879, 16; B. M. 4070; B. R. xxix. 52.)

TETRANTHERA. A synonym of **Litsea** (which *see*).

TETRANTHUS (from *tetra*, four, and *anthos*, a flower; in allusion to the four flowers—two male and two female—in each head). Ord. *Compositæ.* A small genus (two species) of dwarf, creeping, stove herbs, confined to Domingo. Flower-heads whitish, very small, on solitary, filiform peduncles. Leaves opposite, petiolate, ovate. *T. littoralis*, the only species introduced, is probably now lost to cultivation

TETRANYCHIDÆ. A family of Mites, which feed on living plants, on the leaves of which webs are spun by them. The commonest and most hurtful species is *Tetranychus telarius*, commonly known as the "Red Spider."

TETRANYCHUS TELARIUS, or RED SPIDER. This is not a Spider, but a true Mite. It is frequently most injurious to cultivated plants, and is peculiarly hurtful to certain fruit-trees (*e.g.*, Plum), to Hollyhocks, and to many of the more delicate greenhouse plants. A good deal of doubt exists as to whether there is only one species of Red Spider, liable to variation in colour, and in other minor points, or whether there are several closely-related species. It matters little to gardeners whether there are more than one or no, since the habits, harm done by them, and remedies against them, are the same for all, and will be discussed here as if there were but one. The creatures are too small to be seen with the unaided eye, save as minute, moving specks on the leaves; but often their numbers render the effects produced by them conspicuous. Their colour is usually some shade between rust-red and brick-red, but some (probably immature) are greenish, with brown specks on the sides. The body is oval, without any separation between the thorax and abdomen (unlike the structure in Spiders). There are four pairs of nearly equal legs, of which two pairs are turned forwards and two backwards. On the upper part of the body, near the front, are two minute eyes, and a beak or sucker, for boring into, and sucking juices from, the leaves of plants. Near the hinder end of the body, on the lower surface, is a conical wart, which is an organ used for spinning threads.

The name Spider has probably been given to these mites because of their powers of spinning. The females lay eggs; from these emerge larvæ, which differ from the adults in their size, and in having only six legs. The mites, when they establish themselves upon plants, spin webs of very fine texture on the backs of the leaves. They then, by means of their suckers, bore into the leaf-cells and suck out the sap. The leaves become yellowish or greyish-green, marbled with paler patches on the upper surface; the glistening web covering the lower surface renders it grey. A severe attack by Red Spider kills the leaves, which fall prematurely; the fruit crop is lessened; and the young branches formed the next year are stunted and weakened.

Prevention. Attacks of Red Spider are worst when the growth of plants is checked by drought and heat; hence, any measures that promote growth—such as frequent syringing—diminish the risk to some extent. Plants that show symptoms of being attacked, should be at once separated from the rest, and specially treated. Free access of air is much to be recommended. Soot, caustic lime, sand impregnated with spirits of tar, or other similar substances, may be laid round the bases of the stems of the plants to be protected, to prevent the mites from getting access to them. Poles and other supports should have their surfaces planed quite smooth, to prevent the mites from harbouring in crevices, and to allow of being thoroughly washed.

Remedies. Sulphur, in the form of Flowers of Sulphur, is almost a certain cure for Red Spider, and for some Fungi. It is sometimes dusted dry on the leaves, but is better employed in solution, *e.g.*, 1lb. of sulphur, boiled with 2lb. of quicklime in four gallons of water; or the sulphuret of lime may be employed, in the proportion of 4oz. of sulphuret to 2oz. of soft soap and one gallon of boiling water. The sulphuret and the soap should be thoroughly mixed, and must be well stirred while the water is being poured on them. The plants may be dipped into the mixture; and it may be applied to the bark with a stiff brush. Various other washes have been found useful; *e.g.*, Gishurst Compound, Veitch's Chelsea Blight Composition, and solutions prepared from quassia-wood. Fumigation with tobacco-smoke, or with sulphur and chalk, mixed in water and painted on the hot-water pipes, is also recommended. To cleanse infested walls, the following method may be employed with success: Add clay to a solution of soot in water till the mixture is of the consistency of thick paint; then add 1lb. of flowers of sulphur, and 2oz. of soft soap, to each gallon; well mix the whole, and carefully paint the entire surface of the walls with the preparation.

TETRAPASMA. A synonym of **Discaria** (which *see*).

TETRAPELTIS. A synonym of **Otochilus** (which *see*).

TETRAPOGON (from *tetra*, four, and *pogon*, a beard; in reference to the bearded flowers). ORD. *Gramineæ.* A genus consisting of four species of hardy, tufted, often stoloniferous grasses, natives of North Africa, Abyssinia, and Western Asia. Spikelets two or three-flowered, clustered, secund, or nearly distichous; spikes one, two, or three at the apices of the peduncles; glumes two, the lower one empty; stamens three. Leaves flat. *T. villosus*, the only species introduced, is of no horticultural value.

TETRAPTERYS (from *tetra*, four, and *pteron*, a wing; the samaras are four-winged). ORD. *Malpighiaceæ.* A genus comprising about fifty-two species of usually climbing, stove shrubs, natives of tropical America, mostly Brazilian. Flowers yellow or reddish; calyx five-parted, with eight glands, rarely ten or none; petals clawed; stamens ten, all perfect, the alternate ones longer; umbels or racemes often panicled, terminal, rarely sub-sessile. Leaves opposite, entire, often transparent, not glandular; stipules two, variable. The species are rather ornamental, but extremely difficult to bring into flower in this country, and it is doubtful whether those described below are still in cultivation. A compost of peat and sand forms the most desirable soil for them. Ripened cuttings will root in sand, under a hand glass, in heat.

T. citrifolia (Citrus-leaved). A synonym of *T. inæqualis*.

T. discolor (discoloured). *fl.* yellow; pedicels hoary-pubescent, articulated at the middle; umbels four-flowered, paniculate. May. *l.* elliptic or elliptic-oblong, bluntish or slightly acute, coriaceous, glabrous; stipules interpetiolar, deciduous. Guiana and Trinidad, 1827.

T. inæqualis (unequal). *fl.* yellow; petals articulated at or below the middle; umbels four-flowered, paniculate. May. *l.* ovate or elliptic, acute, coriaceous; stipules interpetiolar, deciduous. Brazil and Jamaica, 1818. SYN. *T. citrifolia.*

TETRAQUETROUS. Having four very sharp and almost winged corners or angles.

TETRASTICHOUS. Having a four-cornered spike.

TETRATHECA (from *tetra*, four, and *theke*, a cell; the anthers are sometimes four-celled). ORD. *Tremandreæ.* A genus embracing eighteen species of small, very pretty, glabrous or glandular-hairy, greenhouse, Australian shrubs. Flowers four or five-parted, rarely three-parted, possessing the peculiarity of only opening during bright sun and on fine days, but closing on the approach of evening, or when rain is imminent; stamens sub-biseriate. Leaves alternate, whorled, or scattered, Heath-like and entire or flat and toothed, or reduced to minute scales. A selection of the introduced species is here presented. They are rather difficult to cultivate. A compost of fibry peat, with plenty of silver sand intermixed, is most suitable. Water must be very carefully administered at all times, and only soft rain-water should be used. Propagation may be effected by cuttings of the young wood, inserted in sand, under a bell glass, and kept well shaded.

T. ciliata (hair-fringed). *fl.* pink; sepals bearing a few glandular hairs or bristles; petals about ½in. long. July. *l.* almost all whorled in threes or fours, broadly ovate or nearly orbicular, obtuse or slightly acute, rarely exceeding ½in. in length, the margins flat or scarcely recurved, ciliated or nearly glabrous. Stems slender, erect, or diffuse, 1ft. to 3ft. long.

Tetratheca—*continued.*

T. ericifolia (Heath-leaved). *fl.* pink, on slender pedicels usually longer than the leaves; sepals not reflexed. July. *l.* mostly whorled, narrow-linear with the margins closely revolute, or rarely oblong-lanceolate and more open, mostly under ½in. in length. *h.* 1ft. or less. 1820. Plant diffuse. (S. E. B. i. 20.)

T. ericoides (Heath-like). A synonym of *T. pilosa.*

T. glandulosa (glandular). A synonym of *T. pilosa denticulata.*

T. hirsuta (hairy).* *fl.* pink, rather large, on slender pedicels ¾in. to 1in. long; sepals lanceolate; petals oblong. March. *l.* mostly alternate, a few whorled, ovate-lanceolate to oblong-linear, obtuse, ½in. to 1in. long, the margins recurved, more or less hirsute above, villous or pubescent beneath. Stems rigid and erect, 6in. to 18in. high, often hispid with reddish hairs. 1843. (B. R. 1844, 67; P. M. B. xiii., p. 53.)

T. juncea (Rush-like). *fl.* purple; sepals four, small, ovate, obtuse; petals four, about ⅓in. long; pedicels in the upper axils. July. *l.* few, small and distant, scale-like, rarely ¼in. long. Stems erect or ascending, slender, Rush-like or wiry, 1ft. to 2ft. long, with two or three acute angles or very narrow wings. 1803.

T. nuda (naked). *fl.* crimson, on slender pedicels; sepals and petals five each. May. *l.* very minute and distant, or a very few linear or oblong ones two or three lines long. Rhizome woody, with numerous erect, slender, rigid, but Rush-like stems, 9in. to 18in. high, often ending in an almost pungent point. 1843.

T. pilosa (pilose).* *fl.* purple, rather small, on pedicels usually shorter than the leaves; petals narrow. July. *l.* usually linear, with the margins much revolute, four to six lines long, but in very luxuriant shoots sometimes broadly lanceolate or oblong, with an obtuse base. *h.* 1ft. to 1½ft. 1823. Plant Heath-like. (F. d. S. 1065, under name of *T. ericoides.*)

T. p. denticulata (denticulate-leaved). *fl.*, calyx and pedicels slightly glandular-hairy. *l.* narrow, revolute, occasionally opposite. 1822. (S. E. B. i. 21, under name of *T. glandulosa.*)

T. thymifolia (Thyme-leaved). *fl.* purple; sepals ovate-lanceolate, seldom reflexed. July. *l.* almost all whorled in threes or fours, ovate-elliptic or lanceolate, the margins more or less recurved or revolute. *h.* 1ft. to 3ft. 1824. Plant very pubescent or hirsute. (S. E. B. i. 22.)

T. verticillata (whorled). A synonym of *Platytheca galioides.*

TETRAZYGIA (from *tetra*, four, and *zugos*, a yoke; alluding to the fourfold arrangement of the parts of the flower). ORD. *Melastomaceæ.* A genus comprising about thirteen species of stove, usually furfuraceous shrubs or trees, inhabiting the West Indies. Calyx tube urceolate or globose, constricted above the ovary, the limb four or five-lobed; petals four or five, obovate, obtuse; stamens eight or ten, equal, the filaments subulate; panicles or corymbs terminal, many-flowered. Leaves petiolate, oblong, ovate, or ovate-lanceolate, entire or denticulated, three to five-nerved. The species here described are well worth cultivating. They require similar treatment to that recommended for **Melastoma.**

T. angustiflora (narrow-flowered). *fl.* white, large, but with a narrow calyx; petals five, rarely four, four to five lines long; panicles racemiform, oblong, the primary branches terminated by corymbiform cymes. May. *l.* elliptic or elliptic-lanceolate, abruptly acuminate, 3in. to 5in. long, entire, whitish-downy beneath. Branchlets (and inflore cence) powdery-downy. *h.* 20ft. 1823. Tree. (B. M. 4383, under name of *T. elæagnoides.*)

T. discolor (two-coloured). *fl.* white, small, densely crowded in a corymbiform panicle; petals oval. May. *l.* ovate or ovate-lanceolate, entire, sharp-pointed, 3in. to 5in. long, white beneath with adpressed, scaly down. *h.* 3ft. 1793. A low shrub.

T. elæagnoides (Oleaster-like). *fl.* pink or white, disposed in a corymbiform, or sometimes racemiform, panicle; petals four, three to four lines long. June. *l.* elliptic-lanceolate or lanceolate, sharply acuminate, narrower than those of *T. angustiflora*, whitened beneath by tomentose down. *h.* 2ft. or more. 1848. Shrub.

TEUCRIUM (the old Greek name used by Dioscorides, probably from Teucer, King of Troy, who is said to have first used the plant medicinally). Germander. Including *Polium*, *Scordium*, and *Scorodonia.* ORD. *Labiatæ.* A large genus (nearly 100 species) of greenhouse or hardy herbs, sub-shrubs, or shrubs, of variable habit, dispersed over the temperate and warmer regions of the globe. Calyx tubular or campanulate, rarely inflated, five-toothed; corolla limb quasi-bilabiate, obliquely five-lobed, the two upper lobes very small, the two lateral larger, the lowest largest; stamens four; whorls two or rarely many-flowered, axillary, or disposed in spikes, racemes, or heads. Nutlets obovoid, reticulate-wrinkled. Leaves

Teucrium—*continued.*

entire, toothed, or incised, sometimes multifid; floral ones conformed or reduced to bracts. *T. Botrys*, *T. Scordium* (Water Germander), and *T. Scorodonia* (Wood Sage), are British plants. *T. Chamædrys*, an escape from gardens, has become naturalised. *T. Pseudo-Scorodonia* (Bastard Wood Sage), an inconspicuous species nearly allied to the British *T. Scorodonia*, is now and then met with in gardens. Few of the species have any horticultural merit, but several are of medicinal value. All thrive in any moderately good soil. The shrubs may be increased by cuttings, inserted in sandy soil, under a glass, in spring or summer; the perennials by divisions.

T. betonicum (Betony-like). *fl.* purplish; corolla tube exserted, pubescent outside, the throat inflated and incurved; whorls two-flowered, secund, loosely racemose; racemes 3in. to 6in. long. May to August. *l.* ovate-oblong, 1in. to 1½in. long, on rather long petioles, crenate, woolly below or on both sides; floral ones shorter than the calyx. Branches cano-tomentose. *h.* 1½ft. Madeira, 1775. Greenhouse, evergreen shrub. (B. M. 1114.)

T. bicolor (two-coloured). *fl.* blue; peduncles short, axillary, one-flowered, the upper ones sub-racemose. July. *l.* ovate, oblong, or lanceolate, nearly 1in. long, entire or cut, sometimes trifid; young ones often linear, entire or trifid; floral ones usually exceeding the flowers. Branches 1ft. to 2ft. long, acutely tetragonal. *h.* 1ft. Chili, 1826. Greenhouse, glabrous perennial. SYN. *T. orchideum* (B. R. 1255).

FIG. 19. FLOWERING STEM OF TEUCRIUM CHAMÆDRYS.

T. Chamædrys (Chamædrys).* Wild Germander. *fl.* rosy, ¾in long, the lower lip spotted with white and red; whorls about six-flowered, in the axils of leafy bracts, or sub-secund in leafy, terminal spikes. July to September. *l.* petiolate, ovate, incised-crenate, ½in. to 1½in. long, gradually narrowed into the petioles. Stem 6in. to 18in. long, ascending, much branched. Rootstock creeping. Europe (naturalised in Britain). A hispidly-hairy perennial. See Fig. 19. (Sy. En. B. 1094.)

T. fruticans (shrubby).* Tree Germander. *fl.* blue, on one-flowered peduncles shorter than the tomentose calyx; racemes terminal or lateral on short branchlets, few-flowered. Summer. *l.* ovate, obtuse, entire, flat, very shortly petiolate, glabrous above, white or rufescent-tomentose beneath. Branches divaricate. *h.* 2ft. to 3ft. South Europe, 1869. Greenhouse or half-hardy, evergreen shrub. (Ref. B. 204; S. F. G. 527.) SYN. *T. latifolium* (B. M. 245).

T. hircanicum (Hyrcanian). *fl.* purple, on short, erect, villous pedicels; corolla villous outside; spikes simple, dense, 3in. to 8in. long. September. *l.* petiolate, ovate-cordate, 1in. to 3in. long, deeply crenate, obtuse, scarcely pubescent above, softly sub-canescent beneath. Stems 1ft. to 2ft. high, pubescent, scarcely branched. Persia, 1763. Hardy perennial. (B. M. 2013.)

T. latifolium (broad-leaved). A synonym of *T. fruticans.*

T. Marum (Marum). Cat Thyme. *fl.* reddish-purple, in pairs at the axils of the upper leaves, forming an oblong, generally rather crowded, nearly one-sided inflorescence; corolla with the median lobe sub-orbicular; calyx hairy, with shortly acuminate, lanceolate, nearly equal teeth. Summer. *l.* shortly stalked,

Teucrium—*continued.*

entire, oval or lanceolate, green, pubescent above, white-woolly beneath. Stems shrubby, erect. *h.* 1ft. Western Mediterranean region. Hardy. Cats have a strange liking for this plant.

T. orchideum (Orchid-like). A synonym of *T. bicolor.*

T. orientale (Eastern). *fl.* blue, disposed in a loose, sometimes hispid-pilose panicle; pedicels or peduncles one-flowered, nearly twice as long as the acutely-toothed calyx. July. *l.* once or twice pinnatisect, the lower ones 1½in. to 2in. long, broadly ovate in outline, the floral ones minute; segments linear, entire or incised. *h.* 1ft. Levant, 1725. A hardy, sometimes loosely pubescent or canescent, erect perennial. (B. M. 1279; L. B. C. 1871.)

TEYSMANNIA (so called in honour of J. E. Teysmann, a Dutch gardener, who published a "Catalogus Plantarum," in 1838). ORD. *Palmæ.* A monotypic genus. The species is a dwarf, unarmed, stove Palm, closely allied to *Corypha,* from which it differs mainly in habit. The natives of Sumatra use the leaves of this Palm for thatching their houses, a purpose for which, from their large size and entire form, they are admirably adapted. For culture, *see* **Corypha.**

T. altifrons (tall-leaved). *fl.*, spathes papery-coriaceous, sheathing the fuscous-tomentose peduncle and the spadix branches; spadix rather short, with deflexed branches. *fr.* as large as an apple, globose or depressed-globose, one-celled, one-seeded. *l.* erect, elongated-rhomboid, obtuse, acute at base, 6ft. to 7ft. long, 1½ft. wide, induplicately plicate, laciniated on the margins, the segments obtusely bifid; petioles carinate at back, obsoletely concave in front, the angles rounded, uncinate-prickly. Caudex subterraneous. Sumatra.

THALAMIA. A synonym of **Phyllocladus** (which *see*).

THALAMIFLOROUS. When the stamens arise immediately from the thalamus.

THALAMUS. The receptacle in a flower; the part on which the carpels are placed.

THALASIUM. A synonym of **Panicum** (which *see*).

THALIA (named in honour of J. Thalius, a German physician and botanist, who died in 1588). SYN. *Peronia.* ORD. *Scitamineæ.* A genus embracing about five species of stove, greenhouse, or hardy herbs, natives of tropical America, one species extending as far as the Southern United States, and one being found in tropical Africa. Flowers in pairs, pedicellate, loosely spicate; sepals three, free, equal, membranous, equalling or much shorter than the corolla; petals three, free or very shortly connate at base, equal or the dorsal one scarcely broader; andrœcious tube short, the lobes petaloid, very irregular; panicle terminal; bracts spreading under the branchlets, deciduous. Leaves few, ample; floral ones sometimes conformed. *T. dealbata,* the only species that calls for description here, is an aquatic plant, sufficiently hardy to withstand the severity of our winters, provided it be planted about 2ft. beneath the surface of the water. It is a very elegant subject for aquaria. Propagation may be effected by division of the rootstock.

T. dealbata (whitened). *fl.* purple, small; valves of the spathe unequal, ovate, coriaceous; spikes erect; panicle erect, dense, smooth, the branches not longer than the lanceolate, deciduous bracts at their base; scape terete, Reed-like, 3ft. to 5ft. high. June to September. *l.* distichous, long-petiolate, cordate-ovate, acute, 6in. to 9in. long; petioles 1ft. to 2ft. long. South Carolina, &c., 1791. Plant dusted over with a minute, white powder; otherwise smooth. See Fig. 20. (B. M. 1690.)

T. sanguinea (blood-coloured). A synonym of *Stromanthe sanguinea.*

THALICTRUM (the old Greek name used by Dioscorides, probably derived from *thallo,* to grow green; alluding to the bright colour of the young sprouts). Meadow Rue. ORD. *Ranunculaceæ.* A genus embracing about thirty species of hardy herbs, with perennial stems, nearly all inhabiting North temperate and frigid regions. Flowers green, yellow, purple, or white, often polygamous, paniculate or rarely racemose, usually small with the anthers conspicuously exserted, or rarely larger with smaller anthers; involucre and petals wanting; sepals

Thalictrum—*continued.*

four or five, petaloid; achenes often compressed. Leaves ternately decompound; cauline ones, when present, alternate. Among the species, three of which are included in the British Flora, there are several well deserving of a place at the back of the flower border. A representative selection of the most desirable kinds is presented below. Any fairly good garden soil is suitable. The plants may be multiplied by divisions.

T. alpinum (alpine). *fl.* few; sepals four, purplish; raceme drooping, afterwards erect, simple. July and August. *l.* biternate; leaflets ⅛in. to ¼in. long, sub-orbicular, glaucous beneath, obtusely lobulate. Stem 4in. to 10in. long, often stoloniferous. Europe (Britain), Asia, and North America. (B. M. 2237; Sy. En. B. 2.)

T. anemonoides (Anemone-like).* Rue Anemone. *fl.* several in an umbel; sepals five to ten, white, rarely pinkish, oval, ½in. long. Early spring. *l.* bi- or triternately compound; leaflets roundish, cordate at base, long-petiolulate. Stem arising from a cluster of thickened, tuberous roots. *h.* 6in. North America, 1768. (I. H. 1829, 211; S. B. F. G. ser. ii. 150; B. M. 866 and L. B. C. 964, under name of *Anemone thalictroides.*)

T. a. flore-pleno (double-flowered). This only differs from the type in having double flowers. (F. d. S. 1155; L. B. C. 770.)

FIG. 20. THALIA DEALBATA.

Thalictrum—*continued.*

T. aquilegifolium (Columbine-leaved).* Feathered or Tufted Columbine. *fl.* disposed in a corymbose panicle; sepals white, fugacious; stamens usually purple, sometimes white. May to July. *l.* tripinnate; leaflets sub-orbicular, smooth, deeply toothed; stipules ovate, twin. Stem fistular, purple, mealy. *h.* 1ft. to 3ft. Europe and Asia, 1731. (B. M. 1818; J. F. A. 318.)

T. a. atropurpureum (dark purple).* Stamens and stems dark purple.

T. a. formosum (beautiful). Stamens dark purple, dilated at apex. (B. M. 2025.)

T. a. roseum (rosy). *fl.*, sepals rose-coloured. 1880.

FIG. 21. PANICLE OF THALICTRUM FLAVUM.

T. flavum (yellow). False Rhubarb; Fen Rue, &c. *fl.* often umbellate, erect, crowded; sepals pale yellow, small; anthers bright yellow; panicle compound, sub-corymbose or pyramidal. July and August. *l.* ternately bi- or tripinnate; leaflets 1in. to 1½in. long, three-lobed. Stem 2ft. to 4ft. high, stout. Rootstock yellow, creeping. Europe (Britain) and Asia. See Fig. 21. (Sy. En. B. 8.)

T. glaucum (glaucous). *fl.* crowded in an erect, compound panicle; sepals four or five, yellow. June and July. *l.*, leaflets ovate-orbicular, three-lobed; lobes deeply toothed. Stem erect, round, striated, mealy. *h.* 2ft. to 5ft. South Europe, 1798.

T. minus (lesser). *fl.* yellow, green, drooping, in lax panicles. Summer. *l.* triangular, three or four-pinnate; leaflets variable, acute or obtusely-lobed, often glaucous. Northern hemisphere (Britain). (Sy. En. B. 3.) Some of the forms of this species make desirable border or pot plants on account of their beautiful Maidenhair-like foliage.

T. petaloideum (petaloid-sepaled). *fl.* corymbose; sepals white, nearly round; filaments flesh-coloured; anthers yellow. June and July. *l.* ternately decompound; leaflets smooth, ovate, obtuse, entire or three-lobed. Stem round, almost naked. *h.* 1½ft. Dahuria, 1799. (L. B. C. 891.)

T. tuberosum (tuberous-rooted).* *fl.* loosely corymbose; sepals five, white, oval, blunt. June. *l.* crowded, petiolate, bi-tripinnate; leaflets orbicular, three-lobed, smooth. Root grumose. *h.* 1ft. Spain, 1713.

THALLUS. A fusion of leaves and stem into one general mass.

THAMNEA (from *thamnos*, a shrub; alluding to the nature of the plant). ORD. *Bruniaceæ.* A monotypic genus. The species is a pretty, little, greenhouse undershrub. It thrives in a compost of peat and sand. Propagation may be effected by cuttings, inserted in sand, under a glass.

Thamnea—*continued.*

T. uniflora (one-flowered). *fl.* white, small, terminal, solitary; calyx adnate with the ovary, five-lobed; petals five, with two-keeled claws and an ovate, spreading limb; stamens five, included. April. *l.* very small, somewhat rhomboidal, short, blunt-keeled, closely pressed, spirally inserted; upper ones rather longer, forming an involucre to the flower. Branches filiform, erect, fastigiate. *h.* 1ft. South Africa, 1810.

THAMNOCHORTUS (from *thamnos*, a shrub, and *chortos*, grass; alluding to the habit of the plants). Shrubby Grass. ORD. *Restiaceæ.* A genus comprising ten species of greenhouse, perennial herbs, confined to South Africa. Flowers diœcious, arranged in spikelets. Flowering stems from a creeping or short and erect rhizome, Rush-like, undivided. *T. dichotomus* has been introduced, but it possesses no horticultural merit.

THAMNOPTERIS. Included under *Asplenium.*

THAPSIA (the old Greek name used by Theophrastus, so called from the Island of Thapsos). Deadly Carrot. Including *Melanoselinum* and *Monizia.* ORD. *Umbelliferæ.* A small genus (four species) of greenhouse or half-hardy, perennial (or biennial?), tall herbs, sometimes having a very elongated, shrubby stem, natives of the Mediterranean region and Madeira. Flowers yellowish, dirty-white, or purplish, in compound, many-rayed umbels; calyx teeth small; petals inflexed at apex, shortly acuminate; involucre often wanting. Leaflets pinnately decompound; segments incised-pinnatifid. *T. garganica* has long been celebrated among the Moors for its healing qualities. The species thrive in loamy soil. They may be increased by seeds, or by breaks from the carrot-like root.

T. decipiens (deceiving). Black Parsley. *fl.* white; petals obovate, emarginate; involucre composed of many cut leaves. June and July. *l.* tripinnate; leaflets ovate, acuminate, serrated, the ultimate ones usually confluent; petioles sheathing. Stem terete, simple, naked below, shrubby. *h.* 6ft. Madeira, 1867. (B. M. 5670.)

T. edulis (edible). *fl.* white, small, disposed in compound, many-rayed umbels, furnished with partial and universal involucres of entire leaflets. May. *l.* large, decompound, fern-like, in tufts, from 1ft. to 3ft. in length (including the stalks). *h.* 4ft. Madeira, 1857. The roots, which have long, curved, horn-like divisions, and are black outwards and white within, are eaten in Madeira. SYN. *Monizia edulis* (B. M. 5724).

T. garganica (Garganian). Drias-plant. *fl.* yellow; involucre few-leaved. July and August. *l.* bi-tripinnatisect, shining; segments linear, acute, elongated, quite entire along the margins, decurrent or confluent. Stem terete, glabrous. *h.* 2ft. to 4ft. Mediterranean region, 1683. (B. M. 6293; S. F. G. 287.)

T. villosa (villous). *fl.* yellow; involucre and involucels almost wanting. June and July. *l.* tripinnate, and, as well as the petioles, villous; leaflets oblong, sinuately pinnatifid, the lower ones deflexed. Stem terete, glabrous. *h.* 3ft. to 4ft. South Europe, 1710.

THATCH PALMS. A native name for various species of *Euterpe, Sabal, Thrinax,* &c.

THEA. Included under **Camellia** (which *see*).

THECA. A synonym of **Tectona** (which *see*).

THECA. A spore-case; a sac, tube, shell, or any kind of case containing spores.

THECOSTELE (from *theke*, a receptacle, and *stele*, a column; in allusion to the shape of the gynostegium). ORD. *Orchideæ.* A monotypic genus. The species, a stove, epiphytal Orchid, native of Malacca and the Malayan Archipelago, and bearing a simple raceme of mediocre flowers, is as yet unknown in cultivation.

THELA. A synonym of **Plumbago** (which *see*).

THELEBOLUS (from the Greek works *thele*, a nipple, and *ballo*, I throw; in allusion to the form of the Fungus, and to the mode of ejecting the spores, described below). A small genus of Fungi, which spread over decaying leaves and sticks, and upon the soil in woods during winter. Only one species (*T. terrestris*) is known to be British, and this is by no means common. It forms yellowish patches, sometimes several inches in breadth, composed of a woolly mycelium, on which are numerous smooth, hemispherical bodies; each of these

Thelebolus—*continued.*

is about ⅛in. in diameter, and is surmounted above by a prominent, round mouth. In these bodies the spores are formed, and when they are ripe for being scattered they are pushed, or thrown, from the mouth in a mass which resembles a small nipple in form; hence the name of the genus. When the spores have all been ejected, the top of the Fungus sinks in, so that it resembles a cup. This plant is not of any practical importance to gardeners, though the yellow patches formed by it render it very conspicuous.

THELEPHORA (from *thele*, a nipple, and *phero*, to bear; in allusion to nipple-like growths on the surface of the hymenium in some of the species). A genus of Fungi, most of which grow on the ground in woods. A few, however, are found on tree-trunks or stumps, and at times do mischief to the wood, burrowing between and through the annual rings of growth. *Thelephora* belongs to the group of Mushrooms in regard to the structure of the hymenium, or part on which the spores are formed, and in four spores being formed from each large cell of the hymenium (*see* **Mushrooms**); but it differs from the true Mushrooms in having the hymenium smooth, or bearing mere ridges or warty growths, instead of being spread over gills; and the texture is firm and dry—indeed, almost leathery.

The reproductive organs of *T. laciniata* appear on the diseased trunks in the form of horizontal, semicircular plates, attached by the middle to the bark or wood; a number of such plates uniting, and overlapping one another, to form a mass 4in. or more across. They are covered above with a coat of fibrous or scaly hairs, prolonged round the margins; and each bears the downy, warty hymenium on its lower surface. The whole mass is dull rusty-brown. This Fungus is usually found among the leaves and other plant-remains in the soil in woods; but it often grows closely around the stems or branches of young trees, and thereby kills small or weakly plants, although it is not a true parasite. It is unsafe to form nurseries for seedlings where *T. laciniata* abounds, though this species is seldom dangerous to older trees.

Dr. Hartig, the well-known German writer on the diseases of trees, has described (in the "Lehrbuch der Baumkrankheiten") a disease of Oak-trunks, widely met with in Germany, which he attributes to a Fungus, named by him *T. Perdix*. The specific name is the Latin word for a partridge, and alludes to the fact that the wood in which it grows often resembles in its mottlings the plumage of a partridge. The diseased wood turns to a deep red-brown, with numerous white spots of mycelium. These spots soon become closed cavities, which are lined with the pale threads of the Fungus. The wood rots, turning dark brown, and the cell walls and cell contents decay. The reproductive organs, which are the most readily recognised parts of the Fungus, are semicircular plates from $\frac{1}{10}$in. to ⅛in. across, and of a brown-yellow colour; and they grow on the surface of dead branches, or in hollow spaces in the trunks. These plates continue to increase in size year after year. Though so frequent in Germany, *T. Perdix* does not appear to have been recorded as British.

Another Fungus formerly known as *T. hirsuta*, but now named *Stereum hirsutum*, is very frequent in Britain, on stumps and dead wood of many species of trees. It also is regarded by Dr. Hartig as at times very hurtful to Oak-wood. In general appearance it is much like a true *Thelephora*, but differs in having between the hymenium and its support (pileus) a fibrous layer that is not present in *Thelephora*. The reproductive bodies of *Stereum hirsutum* are somewhat like those of *T. laciniata* in general form; but they are usually pale, and are covered above with grey or pale down, and the hymenium

Thelephora—*continued.*

is yellowish. Where this Fungus gains an entrance into an Oak-trunk, the wood becomes brown, at first on one side, then gradually all round, in concentric layers. In the brown wood there next appear snow-white or yellowish, longitudinal streaks, which, in cross-sections of the trunk, show themselves in the form of small spots. Where air gains free access, through cracks, &c., the wood may become uniformly yellowish, the middle layer of the wall between the cells is dissolved out, and the tenacity of the wood is destroyed by the cells thus becoming separated. Fortunately, *Stereum hirsutum* does not often attack healthy trees. As is the case with almost all internal parasites, comparatively little can be done to cure the evil in a tree; though timely removal of diseased branches may prevent the mycelium from reaching the trunk. But, except in the case of choice specimens, the wise course is to remove and burn, without delay, such trees as show signs of being occupied by the Fungi, in order to prevent the latter from spreading to healthy plants.

THELESPERMA (from *thele*, a nipple, and *sperma*, seed; alluding to the nipple-like protuberances on the achenes). SYN. *Cosmidium*. ORD. *Compositæ*. A small genus (four or five species) of stove or greenhouse, glabrous herbs or sub-shrubs; one is found in extra-tropical South America, and the rest are Mexican. Flower-heads mediocre, heterogamous, on long peduncles; involucre duplex; ray florets, when present, yellow; disk often purplish; achenes glabrous, smooth or tubercled. Leaves opposite, or the upper ones alternate, linear, often filiform, once or twice pinnatipartite or the uppermost ones undivided. The species are probably not now in cultivation in this country.

THELIGONUM. *See* **Thelygonum.**

THELYGONUM (an old Greek name, from *thelygonos*, begetting girls; it was said by Pliny to give the power of producing female offspring). Sometimes spelt *Theligonum*. SYN. *Cynocrambe*. ORD. *Urticaceæ*. A monotypic genus. The species, *T. Cynocrambe* (Dog's Cabbage), is a hardy, slightly fleshy, procumbent, annual herb, broadly dispersed over the Mediterranean region. It is occasionally cultivated as a potherb, but has no value from a horticultural standpoint.

THELYMITRA (from *thelys*, a woman, and *mitra*, a cap; alluding to the hood-shaped column). Woman's-cap Orchid. Including *Macdonaldia*. ORD. *Orchideæ*. A genus comprising about twenty species of greenhouse, terrestrial Orchids, with ovoid tubers; one is broadly dispersed through Australia, New Zealand, New Caledonia, and the Malayan Archipelago, three or four are indigenous to New Zealand, and the rest are all Australian. Flowers blue, purple, red, or yellow, occasionally white, usually several in a terminal raceme; sepals, petals, and lip, all nearly equal and spreading; column rather short, erect, broadly winged; pollen masses granular; bracts shorter than the flowers. Leaves linear, lanceolate, or rarely ovate, sometimes rather thick, but not terete. Stems simple, one-leaved. A selection of the introduced species is given below. All of them are Australian. For culture, *see* **Bletia.**

T. carnea (fleshy). *fl.* pink, one to three; sepals and petals oval-elliptic, oblong, or obtuse, usually about four lines long. May. *l.* narrow-linear. Stem slender, often flexuous, less than 6in. to nearly 12in. high. 1820.

T. Forsteri (Forster's). A synonym of *T. longifolia*.

T. graminea (grass-like). A synonym of *T. longifolia*.

T. ixioides (Ixia-like). *fl.* blue, pedicellate, usually forming a raceme 4in. to 6in. long; sepals, petals, and lip, elliptic-oblong, nine to ten lines long. May. *l.* long-linear or linear-lanceolate, flat or channelled, with one or two shorter ones. Stem usually above 1ft. high. 1810. (S. E. B. 29.)

T. longifolia (long-leaved). *fl.* blue, lilac, or pink, rather large, several in a raceme; column wing produced behind and over

Thelymitra—*continued.*

the anther into a broad hood, usually conspicuous from its dark colour. May. *l.* long, narrow. *h.* variable, usually about 1ft. 1824. SYNS. *T. Forsteri, T. graminea, T. pauciflora.*

T. pauciflora (few-flowered). A synonym of *T. longifolia.*

T. variegata (variegated). *fl.* purple, two to four, large; sepals and petals lanceolate, shortly acuminate or acute, ¾in. to 1in. long, variegated. May and June. *l.* with a villous sheath, the blade usually glabrous, linear, much dilated at base and often undulated. Stem not very stout, 1ft. high or rather more. SYNS. *Macdonaldia spiralis, M. variegata.*

T. venosa (veined). *fl.* blue, six to ten; sepals and petals ½in. to ¾in. long; column broadly winged. April. *l.* long, narrow. Stem 1ft. to 2ft. high. 1826. SYN. *Macdonaldia venosa.*

THELYPOGON. A synonym of **Telipogon** (which *see*).

THEMISTOCLESIA (named in honour of the Greek statesman Themistocles). Including *Centrostemma.* ORD. *Vacciniaceæ.* A small genus (four species) of glabrous, villous, or pubescent, stove, evergreen shrubs, with slender, pendulous branchlets, inhabiting the Andes of Peru, Bolivia, and Venezuela. Flowers disposed in short racemes; calyx tube continuous with the pedicel, campanulate or obconical, the limb minutely five-toothed; corolla tubular, the base or middle of the tube slightly swollen, the limb small, with five recurved teeth; stamens ten, as long as the corolla. Leaves alternate, sub-sessile, rounded or cordate at base, ovate, long caudate-acuminate, coriaceous. *T. coronilla*, the only species calling for description here, thrives in a compost of turfy loam, peat, and sand. It may be increased by cuttings, which readily root in sand or soil, with or without the protection of a glass.

T. coronilla (small-crowned). *fl.*, calyx short, pale green; corolla dark red and shining, glabrous, narrow-urceolate or tubular and inflated below, obscurely five-angled; pedicels axillary, solitary or in pairs. January. *l.* numerous, spreading and deflexed, ½in. long, obtuse, entire, often glabrescent above, pale beneath. Branches stout, and, as well as the leaves, peduncles, and calyces, softly hairy. Venezuela, 1866. A small shrub. (I. H. n. s. 33.) SYN. *Thibaudia coronaria* (B. M. 5575).

THENARDIA (named by Kunth in honour of his friend L. J. Thenard, a Frenchman, who wrote on the chemical physiology of plants). ORD. *Apocynaceæ.* A monotypic genus. The species is an interesting, glabrous, stove, climbing shrub, requiring similar treatment to that recommended for **Dipladenia.**

T. floribunda (bundle-flowered). *fl.* pink, broad, in nearly umbelliform cymes; calyx somewhat five-parted; corolla tube very short, sub-rotate, the lobes five, broad, spreading, twisted; pedicels elongated. June. *l.* opposite, 2½in. to 3½in. long. Branches terete, slender. *h.* 10ft. Mexico, 1823.

THEOBROMA (from *theos*, god, and *broma*, food; referring to the well-known produce of the seeds of *T. Cacao*). SYN. *Cacao.* ORD. *Sterculiaceæ.* A small genus (about half-a-dozen species) of stove trees, inhabiting the warmer parts of America. Flowers rather small; calyx five-cleft or five-parted; petals five, cucullate-concave and contracted into a claw at base, produced above into a spathulate hood; stamens opposite the sepals; peduncles axillary or lateral, one-flowered and fascicled or racemosely many-flowered. Fruit often large, drupaceous, with a woody, five-celled stone; seeds enveloped with pulp. Leaves ample, oblong, undivided, penninerved or three to five-nerved at base. To dilate on the immense economic value of the seeds of *T. Cacao* would be beyond the scope of this work. It may be remarked, in passing, that the annual European consumption of Cacao seeds, in the form of chocolate, &c., is estimated at nearly 40,000,000lb., the Spaniards being the largest consumers. *T. Cacao* will thrive under the same treatment as that recommended for **Ticorea.**

T. Cacao. Cacao or Cocoa Plant; Chocolate Nut Tree. *fl.* fascicled; calyx rose-coloured, the segments lanceolate, acuminate, exceeding the yellowish corolla. May. *fr.* yellow or reddish, ovoid-oblong, 6in. to 8in. long, containing fifty to a hundred seeds. *l.* oblong, acuminate, glabrous, quite entire. *h.* 16ft. to 18ft. Trinidad, &c., 1739. (L. B. C. 545.)

THEODOLITE. An expensive levelling instrument, used by land surveyors for determining important levels and ascertaining the relative heights of objects widely separated from each other. It is provided with a telescope, mounted so that it can be moved to any angle, and a spirit level and adjusting screws for fixing the instrument in its proper position when in use. If the employment of a Theodolite is requisite in a garden, a surveyor generally supplies the instrument and superintends its management.

THEOPHRASTA (named after Theophrastus, the celebrated Greek botanist, who lived about 370-285 B.C.). ORD. *Myrsineæ.* A monotypic genus. The species is a glabrous, stove, evergreen shrub, with robust, erect, nearly simple stems. It thrives in a compost of peat and loam. Cuttings of half-ripened shoots will root in sandy loam, with a surface consisting wholly of sand, if placed in bottom heat, under a bell glass.

T. imperialis (imperial). A synonym of *Chrysophyllum imperiale.*

T. Jussæi (Jussieu's). *fl.* white, rather large, numerous in short racemes; calyx of five ovate, erect segments; corolla cylindrical-campanulate, five-lobed at apex, the lobes spreading; stamens five, affixed to the base of the corolla. *l.* sub-terminal, clustered, spreading, very shortly petiolate, linear-oblong, spiny-toothed, reticulate-nerved. *h.* 3ft. St. Domingo, 1818. (B. M. 4239.)

T. longifolia (long-leaved). A synonym of *Clavija ornata.*

T. macrophylla (large-leaved). A synonym of *Clavija Reideliana.*

T. smaragdina (emerald-green). A synonym of *Deherainia smaragdina.*

THERA (Carpet Moths). A genus of slender-bodied Moths, from 1in. to 1¼in. in spread of front wings, which are grey, with a broad, brown cross-band in the centre. The larvæ feed on the leaves of *Coniferæ*; but seldom do appreciable harm. *See also* **Pinus.**

THERESIA. Included under *Fritillaria.*

THERMIA. A synonym of **Thermopsis** (which *see*).

THERMOMETER. An instrument used for measuring the intensity of heat; one of the most useful and essential in gardens, particularly in glass houses, where the occupants have to be subjected to temperatures regulated to meet their several requirements. An ordinary Thermometer consists of a fine glass tube, with a bulb at one end. In this either some mercury or spirit is placed, and, as it expands or contracts in the tube, the amount of rise or fall in the temperature is indicated. When a Thermometer is made, all air is expelled from the tube and the end is hermetically sealed. The space not filled with the mercury or spirit is thus rendered vacuous, or nearly so, and there is no resistance to the expanding substance when the temperature rises. Every Thermometer tube is provided with a frame of some sort, on which the scale of degrees is marked, to denote the temperature which the expanding or contracting substance indicates Fahrenheit's scale is in general use in this country; there are two others, known respectively as Reaumur's and the Centigrade; the last-named is generally adopted on the Continent. Fahrenheit's scale fixes the freezing-point at 32 deg., and the point at which water boils at 212 deg. In Reaumur's scale, freezing-point is Zero, and boiling-point 80 deg. In the Centigrade scale, the freezing-point is Zero, as in Reaumur's, but boiling-point is 100 deg. The three are, therefore, quite different to read, because of the spaces on the scales between freezing and boiling-points being differently divided.

There are various kinds of Thermometers in use where meteorological observations are taken; many of these are made in special ways, for special purposes: thus, a Maximum registers the highest, and a Minimum the lowest, temperature which has been experienced since the indicators in either of the instruments were last set;

Thermometer—*continued.*

a Solar Radiation is specially made for indicating the highest temperature in the sun's rays; and there is also a Minimum, for laying on the grass. In all gardens, a minimum registering Thermometer is most desirable, for ascertaining the lowest degree reached in frosty weather during any given period; it should be suspended in a position with north aspect, where there is a fair exposure. Ordinary Thermometers, if correctly graduated to the scale, are well adapted for all horticultural purposes under glass. There are also special ones made for use in Mushroom-beds, or other places where there is bottom heat.

THERMOPSIS (from *Thermos*, a Lupine, and *opsis*, resemblance; the species are not unlike Lupines). SYN. *Thermia*. ORD. *Leguminosæ*. This genus embraces about a dozen species of hardy, perennial herbs, natives of North America and Asia (Siberia and Himalayas). Flowers yellow or rarely purple, rather large, in terminal or leaf-opposed racemes; calyx teeth or lobes sub-equal, or the two upper ones connate in one; standard sub-orbicular; keel equalling, or slightly longer than, the wings; stamens free; pedicels solitary. Pods sub-sessile or shortly stipitate. Leaves perfectly alternate, digitately trifoliolate; stipules leafy. The following species have been introduced. They are elegant subjects, but rather difficult to preserve. They succeed best in a light, rich soil. Propagation is most safely effected by means of seeds; for when the plants are separated at the roots, they often decline.

FIG. 22. THERMOPSIS MONTANA, showing Habit and detached Flower.

T. barbata (bearded).* *fl.* six to twelve, shortly pedicellate, opposite or ternate; corolla deep purple, 1in. long. June. *l.* sessile, sub-glabrescent, often opposite; leaflets oblanceolate; stipules resembling the leaflets both in texture and shape. Stems 1ft. or more high, copiously dichotomously branched. Rootstock woody. Himalayas, 1854. (B. M. 4868.)

T. corgonensis (Corgon). *fl.* yellow, twin on the racemes, nearly sessile; calyx villous. June and July. *l.* sessile or very shortly petiolate; leaflets ovate, acute; stipules constituting with the leaflets a kind of half-whorl. *h.* 1ft. to 2ft. Corgon Alps, 1820.

T. fabacea (Bean-like). A synonym of *T. montana*.

T. lanceolata (lance-shaped). *fl.* yellow, twin or somewhat whorled; calyx cleft to the middle; bracts large; racemes terminal. June and July. *l.* nearly sessile, the lower and the highest ones often simple; leaflets oblong-lanceolate, silky-puberulent on both sides; stipules half the length of the

Thermopsis—*continued.*

leaflets. *h.* 1ft. Kamtschatka, 1779. SYN. *Podalyria lupinoides* (B. M. 1389).

T. montana (mountain).* *fl.* yellow, alternate; racemes terminal. June and July. *l.* petiolate; leaflets broadly oval; stipules broadly ovate, obtuse, shorter than the petioles. *h.* 1ft. to 2ft. North America, 1818. See Fig. 22. (B. M. 3611; B. R. 1272; L. B. C. 1856.) SYN. *T. fabacea*.

T. nepalensis (Nepaul). A synonym of *Piptanthus nepalensis*.

THEROLEPTA. A synonym of **Marshallia** (which see).

THEROPOGON (from *theros*, summer, and *pogon*, a beard; in allusion to the time of flowering and the tuft-like appearance of the plant). ORD. *Liliaceæ*. A monotypic genus. The species is a greenhouse, herbaceous perennial, of tufted habit, with grass-like leaves and the general habit of *Anthericum*, of frequent occurrence in the Himalayas. The most suitable soil for the cultivation of this plant is one composed of sandy loam and leaf mould. Propagation may be effected by seeds, sown on a hotbed, during spring; or by divisions.

T. pallidus (pale).* *fl.*, perianth white, sometimes tinged with red, three to four lines long, the segments broad, imbricated; pedicels solitary; raceme terminal, loose, 2in. to 3in. long, ten to twenty-flowered; scape slender, firm, shorter than the leaves. Spring. *l.* six to eight, nearly 1ft. long, persistent, glabrous, two to three lines broad, distinctly ribbed, green above, glaucous beneath. 1875. (B. M. 6154.)

THESIUM (*Thesion* was the old Greek name used by Theophrastus for this or some similar plant; probably derived from Theseus, the legendary hero). ORD. *Santalaceæ*. A large genus (over 100 species) of stove, greenhouse, or hardy herbs, natives of temperate and tropical regions: two are found in Brazil; the rest are wholly absent in America. Flowers spicate or racemose, or one to a peduncle, or forming a compound, cymose inflorescence. Leaves alternate, linear, often small, sometimes reduced to minute scales. A few of the species have been introduced, but they are unworthy of cultivation.

THESPESIA (from *thespesios*, divine; *T. populnea* is frequently planted about churches in the tropics). ORD. *Malvaceæ*. A small genus (about half-a-dozen species) of stove trees or tall herbs, found in tropical Asia, the Pacific Islands, and Madagascar. Flowers often yellow, showy; calyx not conspicuously dotted, truncate, rarely five-cleft; ovary five-celled. Leaves entire or angular-lobed. Two species have been introduced; both are trees. They thrive in a compost of loam and peat. Ripened cuttings will root freely in sand or mould, under a hand glass, in heat.

T. grandiflora (large-flowered). *fl.* red, 4in. to 5in. in diameter, on pedicels 4in. long. May. *l.* ovate, rather cordate, slightly acuminate. *h.* 30ft. Porto Rico, 1827. In habit, this species resembles *T. populnea*.

T. populnea (Poplar-like). Mahoe; Portia-nut Oil-plant; Umbrella-tree. *fl.* at first yellow, with a purple central spot, but changing altogether to purple before they die off in the evening; pedicels 1½in. to 2in. long; peduncles equalling the petioles. June. *l.* roundish-cordate, acuminate, five to seven-nerved, covered beneath with dot-like scales. *h.* 40ft. Tropics of Old World, 1770.

T. p. guadalupensis (Guadaloupe). *fl.*, petals narrower than in the type, fringed at base; pedicels 1in. long. Cultivated in Guadaloupe.

THEVETIA (so called after Andr. Thevet, 1502-1590, a French monk, who travelled in Brazil and Guiana). ORD. *Apocynaceæ*. A genus embracing about eight species of glabrous, stove, American shrubs or small trees, extending from Paraguay to Mexico. Flowers yellow, large, in terminal cymes; calyx five-parted, with acute, spreading segments; corolla funnel-shaped, the cylindrical tube abruptly expanded into a campanulate throat, the lobes broad and twisted; stamens inserted at the apex of the tube. Drupe broader than long. Leaves alternate, one-nerved or slenderly penniveined. Three species are known to cultivation. They thrive

Thevetia—*continued.*

in fibrous loam. Propagation may be effected by cuttings, inserted in sand, under a bell glass, in heat.

T. Ahouai (Ahouai). *fl.* pale yellow, on thick pedicels; corolla ribbed, with spreading lobes; pedicels thick, as long as the calyx; cymes terminal, contracted, many-flowered. June. *l.* oblong-obovate, acute, acuminate at base, 4in. long, highly glabrous above, sparsely pilose beneath. *h.* 20ft. Brazil, 1739. SYN. *Cerbera Ahouai* (A. B. R. 231; B. M. 737).

T. neriifolia (Oleander-leaved). Exile Oil Plant. *fl.* saffron-yellow, about 3in. long; calyx segments about half the length of the cylindrical part of the corolla, which is one-third the length of its enlarged throat; cymes sub-terminal, much shorter than the leaves, few or sometimes one-flowered. June. *l.* linear, glabrous, shining above, 3in. to 6in. long. *h.* 12ft. Tropical America and West Indies, 1735. SYN. *Cerbera Thevetia* (B. M. 2309).

T. Yccotli (Yccotli). *fl.* similar to those of *T. neriifolia*, 3in. long; corolla lobes three times the length of the tube; cymes sub-terminal, one to three-flowered. June. *fr.* green, warted, the size of a small apple. *l.* narrow-linear, acuminate at both ends, the margins revolute, glabrous above, slightly pilose beneath. *h.* 8ft. Mexico, 1800.

THIBAUDIA (named in honour of Thiebaut de Berneaud, Secretary of the Linnean Society of Paris, and a botanical writer). ORD. *Vacciniaceæ*. A genus to which only a couple of species are referred by Bentham and Hooker; they are very elegant, stove shrubs, natives of the Andes of New Grenada and Peru. Flowers scarlet, pedicellate, numerous, in axillary racemes; calyx tube continuous with the pedicel, terete, the limb short, obtusely five-lobed or five-toothed; corolla tubular, terete, the limb of five small, sub-erect lobes; stamens ten, as long as the corolla tube; pedicels bracteate at base, and sometimes bracteolate. Leaves alternate, persistent, petiolate or sub-sessile, coriaceous, penninerved, entire. The species thrive in a compost of turfy loam, peat, and sand. Cuttings will readily root in sand or soil, with or without the protection of a glass. Other species formerly included here will now be found under **Proclesia, Psammisia, Themistoclesia,** &c.

T. floribunda (bundle-flowered). *fl.* glabrous, on very long pedicels; racemes solitary, nearly 2in. long, with imbricated bracts at base. *l.* oblong-lanceolate, acuminate, reticulate-veined. Branches nearly terete, smooth, greyish. New Grenada.

T. pichinchensis (Pichinchan). *fl.* seven lines long; calyx furfuraceous-tomentose, the teeth mucronulate; corolla glabrous; racemes shorter than the leaves. *l.* very shortly petiolate, oval-oblong or sub-lanceolate, obtuse and acuminate, rounded at base, 3in. to 4in. long. *h.* 6ft. to 12ft. Pichincha, 1849.

THICK-LEAF. A common name for **Crassula** (which *see*).

THIEBAUTIA. A synonym of **Bletia** (which *see*).

THIMBLEBERRY. *See* **Rubus occidentalis.**

THINNING-OUT. A common term which refers to the work of reducing the number of seedlings of any description when they are too much crowded for the proper development of all. It should be attended to, amongst seedlings, at an early stage, if it is necessary at all, else the whole lot may become drawn, and thereby weakened. Thinning-out also applies to the cutting of shoots or branches—as, for instance, on fruit-trees—and to the reduction in quantity of various other subjects when the space is only available for a portion of the whole.

THISTLE. A common name for the species of *Carduus* and *Cnicus*, and other plants.

THISTLE, BLESSED. *See* **Silybum Marianum.**

THISTLE, COTTON. *See* **Onopordon Acanthium.**

THISTLE, GLOBE. *See* **Echinops.**

THISTLE, GOLDEN. *See* **Scolymus hispanicus.**

THISTLE, HEDGEHOG. *See* **Echinocactus.**

THISTLE, HOLY. *See* **Silybum Marianum.**

THISTLE, MELON. *See* **Melocactus.**

THISTLE, OUR LADY'S MILK. *See* **Silybum Marianum.**

THISTLE, SOW. *See* **Sonchus.**

THLADIANTHA (from *thladias*, compressed, and *anthe*, a flower; owing, it is said, to the plant being first described from a pressed specimen!). ORD. *Cucurbitaceæ*. A genus including three or four species of climbing, greenhouse or hardy herbs, natives of North China, Java, and the Himalayas. Male flowers golden, rather large, solitary or racemose; calyx tube shortly campanulate, the bottom shut by a horizontal scale, the segments five, lanceolate; corolla campanulate, five-parted, the segments revolute about half-way down; filaments five. Female flowers solitary; calyx and corolla as in the males; ovary oblong; style deeply trifid, with three reniform stigmas. Fruit green, oblong, fleshy, many-ribbed. Leaves ovate-cordate, with a deep sinus, denticulate. *T. dubia*, the only species introduced, will thrive in almost any soil, but perhaps succeeds best when planted against a sunny wall.

T. dubia (doubtful).* *fl.*, males approximate; calyx teeth very narrow; petals ¾in. long; filaments minutely hairy; racemes 2in. to 3in. long, with prominent bracts; female peduncle 2in. to 3in. long, more or less hairy, the ovary densely woolly. *fr.* 1½in. by ¾in., glabrous, obtuse at both ends. *l.* deeply cordate-ovate, acute, undivided, 4in. by 2½in., denticulated, not angular, usually villous beneath; petioles 1in. to 1½in. long. Hardy. India and China, 1864. (B. H. 1872, 6; B. M. 5469; in both these figures, however, the female flower and fruit belong to another species.

THLASPI (probably from *Thlaspis*, the old Greek name for Cress, used by Dioscorides, from *thlas*, to bruise; its seeds being bruised as a condiment). Bastard Cress; Besom Weed; Penny Cress. ORD. *Cruciferæ*. A genus comprising from twenty-five to thirty broadly-distributed species of annual or perennial, scapigerous herbs. Flowers white, pink, or pale purple, racemose. Radical leaves rosulate; cauline ones hastate-auriculate. None of the species are worth cultivating. *T. alpestre*, *T. arvense* (Boor's or Mithridate Mustard), and *T. perfoliatum* are British weeds.

THOMASIA (named in memory of Peter and Abraham Thomas, collectors of Swiss plants in the time of Haller). ORD. *Sterculiaceæ*. A genus comprising twenty-five species of very elegant, Australian, greenhouse shrubs, with the habit of *Lasiopetalum*, but with the leaves often lobed or cut. Flowers often tomentose; calyx usually purple, bluish, or white, five-lobed; petals none, or minute and scale-like; stamens five, alternate with the sepals, free or slightly connate at the base; bracts narrow, deciduous; bracteoles under the calyx three; racemes leaf-opposed, simple or rarely cymosely branched. Stipules leafy. The under-mentioned species are well worth cultivating in every collection. They thrive in a compost of loam, peat, and sand. Cuttings of the ripened wood will root freely in sand, under a glass.

T. foliosa (leafy). *fl.* small, on slender pedicels; petals none; racemes numerous, often branched, slender, hirsute. June. *l.* petiolate, ovate-cordate, deeply sinuate-lobed, rarely above 1in. long, sprinkled with stellate hairs above, more densely hirsute beneath. *h.* 3ft. 1825.

T. glutinosa latifolia (glutinous, broad-leaved). *fl.* pink, pretty, disposed in racemes; stamens, as well as a blotch at the base of the petals, dark brownish. Summer. *l.* stalked, cordate, acute, covered with stellate hairs. 1885. An attractive plant. (R. G. 1186.)

T. grandiflora (large-flowered). *fl.*, calyx red, spreading to about 1in. in diameter, not divided to the middle; petals none; racemes terminal. June. *l.* mostly ovate-lanceolate or oblong, or the lowest ovate, obtuse, ½in. to 1in. long, entire, cordate or obscurely three-lobed at base, glabrous or sprinkled with a few stellate hairs. *h.* 3ft. 1840.

T. macrocarpa (large-fruited).* *fl.*, calyx red, opening to about 1in. in diameter, loosely woolly-hirsute outside; racemes tomentose-hirsute, few-flowered. June. *l.* broadly ovate-cordate,

Thomasia—*continued.*

obtuse, 1½in. to 2in. long, irregularly angular-toothed or shortly lobed, pubescent above when young, at length glabrous, tomentose beneath. *h.* 3ft. or more. 1842. (B. M. 4111, under name of *T. stipulacea.*)

T. purpurea (purple). *fl.* rather small, on very short pedicels; calyx purple, about ½in. in diameter; petals small, occasionally wanting; racemes longer than the leaves. June. *l.* oblong or nearly linear, obtuse, ½in. to 1in. long, entire, sprinkled with stellate hairs above, more hirsute beneath, or rarely nearly glabrous. *h.* 2ft. 1803. SYN. *Lasiopetalum purpureum* (B. M. 1755).

T. quercifolia (Oak-leaved). *fl.* rather small; calyx purple, the lobes not reaching the middle, broad and obtuse; petals none; racemes simple. May. *l.* ovate, usually deeply three-lobed, the lateral lobes short, divaricate, and often obtusely three-lobed, the middle one longer, often three-lobed, the whole leaf rarely exceeding 1in., sprinkled with stellate hairs above, rigidly hirsute beneath. *h.* 2ft. 1803. SYN. *Lasiopetalum quercifolium* (A. B. R. 459; B. M. 1485).

T. solanacea (Solanum-like). *fl.*, calyx white, more or less tomentose, about ½in. in diameter, divided to rather below the middle; petals usually wanting; racemes pedunculate, several-flowered, occasionally branched. June. *l.* deeply cordate-ovate, obtuse, mostly 1½in. to 3in. long, rather deeply sinuate-lobed, scabrous or hirsute above, softly and densely tomentose or hirsute beneath. *h.* 3ft. and upwards. 1803. SYN. *Lasiopetalum solanaceum* (B. M. 1486).

T. stipulacea (prominent-stipuled). A synonym of *T. macrocarpa.*

THOMSONIA (named in honour of Dr. A. T. Thomson, author of "An Introduction to Botany"). SYN. *Pythonium.* ORD. *Aroideæ* (*Araceæ*). A genus including only a couple of species of stove, tuberous, perennial herbs, natives of the Himalaya and Khasya Mountains. Flowers monœcious, the males and females closely contiguous; spathe coriaceous, deciduous, oblong, boat-shaped, with an indistinct tube; spadix sessile, nearly equalling the spathe; peduncle elongated. Leaves long-petiolate, tripedatisect; segments pinnatipartite; pinnæ oblong-lanceolate, acuminate. For culture, *see* **Caladium.**

T. Hookeri (Hooker's). *fl.*, female inflorescence rather shorter than the male; peduncle elongated, slender. *l.* seven-pedatisect; segments oblong-lanceolate, acuminate, cuneate-narrowed towards the base, distant, gradually becoming smaller; petiole elongated, slender, spotted. Tuber small. *h.* 2ft. Churra, 1840.

T. nepalensis (Nepaul). *fl.*, spathe greenish, oblong-cymbiform, obtuse, coriaceous, thick; spadix green, the perfect male flowers purplish-yellow, the sterile ones yellow. *l.* trisected; middle segment pseudo-dichotomous, the partitions pinnatipartite, the segments alternate, oblong-lanceolate, acuminate, cuneate at base, decurrent; nerves of the lateral segments numerous, spreading; petioles reddish below, irregularly spotted and mottled with fuscous-green. Tuber large. *h.* 2ft. Nepaul, 1816.

THORN. A common name for various species of *Acacia, Cratægus,* &c.

THORN. The same as **Spine** (which *see*).

THORN APPLE. *See* **Datura Stramonium.**

THORN BROOM. *See* **Ulex europæus.**

THORN, CHRIST'S. *See* **Paliurus aculeatus** and **Zizyphus Spina-Christi.**

THORN, GARLAND. *See* **Paliurus aculeatus.**

THORN, GOAT'S. *See* **Astragalus Tragacantha.**

THORN, JERUSALEM. *See* **Parkinsonia aculeata.**

THOUINIA (named in honour of André Thouin, 1747-1824, Professor of Agriculture at Paris). SYNS. *Thyana, Vargasia.* ORD. *Sapindaceæ.* A genus consisting of about a dozen species of stove, erect or climbing shrubs or trees, inhabiting tropical America. Flowers small or minute, racemose, cymose, or paniculate; calyx five-parted; petals four, five, or absent; stamens eight to ten. Leaves alternate, exstipulate, trifoliolate or pinnate, rarely one-foliolate. Only one species has been introduced. For culture, *see* **Ticorea.**

Thouinia—*continued.*

T. pinnata (pinnate-leaved). *fl.* white, disposed in terminal panicles, and having five petals and eight stamens. June. *l.* pinnate; leaflets oblong, slightly emarginate. *h.* 8ft. St. Domingo, 1823. Erect.

THOUSAND-LEGS. A common name for **Millipedes** (which *see*).

THREE BIRDS ORCHIS. *See* **Pogonia pendula.**

THREE FACES UNDER A HOOD. *See* **Viola tricolor.**

THRIFT. *See* **Armeria.**

THRINAX (from *thrinax,* a fan; alluding to the form of the leaves). ORD. *Palmæ.* A genus comprising about ten species of stove, mediocre or dwarf, unarmed Palms; one is a native of Florida, and the rest inhabit the Antilles. Flowers sometimes long and slender, pedicellate; spathes many, papery-coriaceous, cut; spadices elongated, the rachis clothed with a tubular sheath, the primary branches alternate, paniculate, the branchlets slender. Fruit small, pea-like. Leaves terminal, orbicular or truncate at base, flabellately plicate and multifid; segments induplicately bifid; petioles slender, biconvex. Trunks solitary or tufted, annulated below, above covered with the persistent bases of fallen leaves. The genus includes some very beautiful plants, the best-known of which are here described. They succeed best, when young, in a compost of loam, peat, and sand; as they get older, turfy loam and sand is preferable. Propagated by seeds, which, like all Palm seeds, should be obtained when freshly imported, sown in well-drained pots or pans of sandy loam, and plunged in bottom heat.

T. argentea (silvery). Broom Palm; Silver Thatch, &c. *fl.*, partial spathes three or four only; spadix 1ft. long, slightly paniculate. *fr.* small. *l.* shorter than the petioles, silvery-silky beneath; divisions united at the base; ligule concave, somewhat crescent-shaped. Trunk 12ft. to 15ft. high, 2in. to 3in thick. West Indies, 1830.

T. barbadensis (Barbados).* *fl.*, spadix paniculate, 2ft. long. *fr.* ⅛in. in diameter. *l.* green, glabrous, very large, fan-shaped or digitate-multipartite; segments lanceolate, acuminate; petioles covered with a thick felt of small, white scales, and edged with black, hooked, ascending spines. Trunk 12ft. high. Barbados, 1875.

T. elegans (elegant). A garden synonym of *T. radiata.*

T. excelsa (tall). *fl.*, spathe rusty-tomentose; spadix with spreading-recurved branches, its axis 1ft. long, naked below. *fr.* globose, ¼in. in diameter. *l.* 4ft. to 5ft. long, pale green above, hoary-glaucous beneath by minute, appressed down, about fifty-cleft; divisions about 2ft. long, 1in. to 3in. broad, united to about one-third their length. *h.* 7ft. and upwards. Jamaica, 1800.

T. gracilis (slender). A garden synonym of *T. radiata.*

T. graminifolia (grass-leaved). A synonym of *T. multiflora.*

T. multiflora (many-flowered).* *fl.*, primary spathes twelve to fifteen, tubular, obliquely opening, acute, longitudinally nerved; secondary spathes funnel-shaped, compressed at base; spadices erecto-patent. *l.* six to ten, erecto-patent, sub-orbicular, peltately radiate; segments forty or more, united half-way, the middle ones 2¼ft. to 3ft. long, 2½in. broad at base, the free part ensiform, long-acuminate, flat, acutely bifid at apex; sheaths 6in. to 9in. long. Caudex 6ft. to 8ft. high, 4in. to 5in. thick, deeply and irregularly annulate. Haiti. SYN. *T. graminifolia* (I. H. n. s. 187).

T. parviflora (small-flowered).* Palmetto Thatch; Royal Palmetto Palm. *fl.*, perianth minute; spadix 2ft. to 3ft. long, paniculate. *fr.* dry, rather rough, ¼in. in diameter. *l.* puberulous, glabrate and green beneath, 10in. to 2ft. long; divisions united one-sixth to one-quarter their length; ligule deltoid. Trunk 10ft. to 12ft. high. Jamaica, 1778.

T. pumilio (dwarf). *l.* digitately multipartite; segments ensiform, acuminate, green on both sides, the middle nerve ferrugineous-ramentaceous beneath, the secondary ones six to eight, impressed on both sides; ligule triangular. Trunk short or mediocre. Trinidad, 1830.

T. radiata (rayed).* *fl.*, spadix 2ft. to 3ft. long, paniculate. *l.* green, glabrous or puberulous beneath, 1ft. to 2ft. long; divisions united to or beyond one-third their length; ligule broadly rounded, with a short, blunt appendage at the middle. Trunk short. Trinidad, 1838. See Fig. 23, p. 30. SYNS. *T. elegans* and *T. gracilis* (of gardens).

THRINCIA. Included under *Leontodon.*

THRIPS (a Greek word for a moth). The name given to a group of small insects that often do much harm to cultivated plants, by gnawing the surface of flowers and tender twigs and leaves, thus causing withered and distorted spots to appear on them. The genus *Thrips*, along with certain closely-related genera, is ranked in a family known as the *Thysanoptera* (from *thysanoeis*, fringed, and *ptera*, wings), or as *Physopoda* (from *physa*, a bladder, and *poda*, feet). Both names allude to characteristic features in the structure of the fully-developed insects. Thrips are very common in flowers, crawling about the interior of the corolla tube, and over the stamens, or living upon or in the fruits, or on the lower surface of the leaves. They feed upon the more delicate parts of the plants, causing them to become withered and blighted. The mature insects are very small, and are black or dark-coloured. They are long and narrow, and are furnished with four straight, narrow wings, which are fringed with long hairs, and have few, if any, veins (see Fig. 24). They have three pairs of legs, on which the last joints end in a bladder-like swelling without claws. The mouth is provided with parts suited for piercing delicate tissues of plants, and for sucking their juices. The earlier stages in the de-

Thrips—*continued.*

velopment of the species of *Thrips* are much like the mature insects, save in colour (which is usually dull yellow), and in the wings being entirely absent from the larvæ, and represented only by short wing-cases in the pupæ. The structure just described renders the order intermediate between *Orthoptera* (to which Grass-hoppers, Locusts, &c., belong) and *Hemiptera*. *See* **Insects.**

FIG. 23. THRINAX RADIATA (see page 29).

FIG. 24. THRIPS (magnified).

Many species have been described, so much alike as to render it very hard to distinguish them from each

Thrips—*continued.*

other; but gardeners do not require to spend time in determining their identity, as the habits of all are much alike, and the treatment is similar for all. The genera are distinguished chiefly by the presence or absence of veins in the wings, the hairy coating on the body, and differences of minor importance. One of the most hurtful kinds is *Heliothrips hœmorrhoidalis* (? *H. Adonidum*, Hal.), which injures plants in hothouses, as well as in winter gardens. The leaves become paler in colour, or turn black, and fall off. The young twigs also are frequently attacked and killed. This species is dark brown, with the tip of the body red-brown, and the eyes and limbs pale yellow. It is only about $\frac{1}{20}$in. long.

Remedies. Smoking the plants with tobacco, as for Aphides, or with insect-powder, washing them with infusion of tobacco, dipping them in soapy water, and keeping them for a time in the open air in summer, are methods that have been tried with success. There are no good remedies against the species of *Thrips* that feed on plants cultivated in the open air; but, fortunately, their attacks are seldom very hurtful to hardy plants. Choice subjects may be freed from their attacks by drawing the leaves between the finger and thumb, with sufficient pressure to crush the soft larvæ, but not to injure the leaves.

T. Phylloxeræ has been observed, in the United States of America, depositing eggs in the galls of *Phylloxera vastatrix* (*see* **Grape or Vine Louse**). The larvæ hatched from these eggs destroy multitudes of the *Phylloxera*.

THRIXSPERMUM. A synonym of **Sarcochilus** (which *see*).

THROAT. The orifice of a gamopetalous flower.

THROAT-ROOT. *See* **Campanula Cervicaria.**

THROATWORT. *See* **Trachelium.** The name is also applied to *Campanula Cervicaria* and *Digitalis purpurea.*

THRUST-HOE. Another name for the Dutch Hoe, a tool which the workman pushes from him when using

FIG. 25. THRUST-HOE.

it (see Fig. 25). It is well adapted for light work on a fairly even surface, and for hoeing flower-beds, &c., when it is necessary to loosen the surface, while standing upon the adjoining walk, instead of on the soil. *See* **Hoes and Hoeing.**

THRYALLIS (the old Greek name used by Theophrastus for *Verbascum*; it means a wick, and was appropriate enough to the original plant, but not to the present). ORD. *Malpighiaceæ.* A small genus (three species) of stove, climbing, stellately hoary-pubescent, Brazilian shrubs. Flowers yellow; calyx five-parted, without glands; petals shortly clawed, glabrous, the limb fringed; stamens ten, all perfect; pedicels bibracteolate, articulated above the base; corymbs paniculate, axillary and terminal, effuse. Leaves opposite, entire, glabrous above, whitish beneath; petioles biglandular; stipules inconspicuous. Only one species is known in gardens. It thrives in a compost of loam and peat. Ripened cuttings will root in sand, under a hand glass, in heat.

T. brachystachys (short-spiked). *fl.* disposed in short, paniculate racemes. August. *l.* ovate-lanceolate, glaucous-green above, white beneath. 1823. (B. R. 1162.)

THRYPTOMENE (from *thrypto*, to break or crush; in allusion to the humble, Heath-like aspect of the plant). ORD. *Myrtaceæ.* A genus comprising seventeen species of greenhouse, Heath-like, glabrous, Australian shrubs. Flowers small, axillary, solitary or rarely in twos or threes; calyx five-lobed, persistent; petals five, persistent, usually connivent over the stamens; stamens five or ten. Leaves opposite, small, entire. The only species introduced was formerly included under **Bæckea** (which *see* for culture).

T. saxicola (rock-loving). *fl.* white, on slender pedicels $\frac{1}{6}$in. long, in the upper axils. July. *l.* obovate-oblong, flat, obtuse or slightly acute, $\frac{1}{8}$in. to $\frac{1}{4}$in. long, the midrib scarcely conspicuous. *h.* 3ft. to 4ft. (rarely diffuse or prostrate?). 1824. SYN. *Bæckea saxicola* (B. M. 3160).

THUJA. *See* **Thuya.**

THUNBERGIA (named after of C. P. Thunberg, 1743-1822, a traveller in Batavia and Japan, and afterwards Professor at Upsala). Including *Hexacentris* and *Meyenia* (of Nees). ORD. *Acanthaceæ.* A genus embracing nearly thirty species of beautiful, stove, twining or dwarf and sub-erect, annual or perennial herbs, inhabiting South and tropical Africa, Madagascar, and the warmer parts of Asia. Flowers purple, blue, yellow, or white, shortly pedicellate, solitary in the axils, or disposed in terminal racemes; calyx annular, short, truncate or ten to fifteen-toothed; corolla conspicuous, the tube ventricose,

FIG. 26. THUNBERGIA ALATA, showing Habit and Portion of Flowering Branch.

curved, the limb oblique, of five rounded lobes, twisted to the left in bud; stamens four, didynamous near the base of the corolla tube; disk cushion-shaped or annular; bracts at the base of the pedicels leaf-like; bracteoles large, the margins coherent, at least when young. Capsule thickly coriaceous, suddenly narrowed into a sword-shaped beak. Leaves opposite, ovate, lanceolate, cordate, or hastate. The best-known species are here described; all are perennial, except where otherwise stated. Nearly all flower during the summer months, but some of the woody ones blossom in spring or late winter. The plants are of easy culture in any moderately good soil, but thrive best in a rich compost of fibrous loam and sand, to which may be added a small quantity of well-decayed manure. If the plants are grown in a brisk, moist, stove temperature, and the pots well drained, success is assured. Attention must be directed to pruning unsightly or bare shoots, before growth commences in spring, or else the plants will become straggling. Propagated by seeds, and also by cuttings of moderately firm young wood, placed in a propagating frame, with a temperature of from 65deg. to 70deg. *T. alata* and its varieties succeed under warm greenhouse treatment, and may readily be raised from

Thunbergia—*continued.*

seeds, sown in 5in. pots, in March or April. When large enough to pot off, the seedlings may be placed singly in other pots or in baskets, when they will soon grow into flowering specimens. A rather rich soil—loam and leaf mould or decayed manure, in the proportion of one part of the latter to two of the former—will suit admirably. In the young stages of growth, the plants should be subjected to stove treatment. When in flower, these Thunbergias are admirably adapted for edging groups, of plants along with other dwarf-growing subjects.

T. alata (winged).* *fl.*, calyx twelve-cleft above the middle; corolla yellow, purple below, 1½in. long, the tube curved, the limb campanulate; stigma funnel-shaped, entire, ciliated. *l.* cordate-sagittate, acute, repand, with a rather broad sinus, the lobes diverging, acute or mucronate; petioles winged. South Africa, 1823. A softly silky-villous, canescent annual twiner. See Fig. 26. (B. M. 2591; H. E. F. 17.) There are a few varieties, of which the principal are: *alba* (B. M. 3512; P. M. B. ii. 2 and iii. 28; S. B. F. G. ser. ii. 392), with white, and *aurantiaca* (L. B. C. 1045; H. E. F. 177; B. v. 238), with deep yellow, flowers.

T. a. Doddsii (Dodds'). *fl.* yellowish-orange, with an eye of rich purplish-violet, large. *l.* irregularly bordered with white. (F. d. S. 415.)

T. angulata (angular). *fl.*, calyx twelve-parted; corolla pale blue with a yellow throat, 1in. long, the tube very short, the limb campanulate-infundibuliform, the segments rounded; bracteoles ovate, acuminate. *l.* on long petioles, cordate-sagittate, 1½in. long, ¾in. broad, with a deep sinus; segments truncate, slightly mucronate, long-acuminate. Madagascar, 1823. A scabrous-pubescent climber. (H. E. F. 166 and 177, f. 3; L. B. C. 1044.)

T. capensis (Cape). *fl.* yellow; calyx limb many-toothed; corolla tubular-campanulate. *l.* nearly round, slightly toothed, obtuse, very shortly petiolate, and, as well as the procumbent stems, hairy. Cape of Good Hope, 1824. Annual. (L. B. C. 1529.)

T. chrysops (golden-eyed). *fl.*, calyx slightly fleshy, truncate; corolla campanulate-infundibuliform, the tube yellow, much contracted at base, expanded above, the limb of a beautiful purple, with a blue ring; peduncles axillary, solitary, shorter than the petioles, one-flowered. *l.* cordate-angular, rather obtuse with a mucrone, slightly pubescent-scabrous. Stem slender, puberulous. *h.* 3ft. Sierra Leone. Annual. (B. M. 4119; F. d. S. i. 5; P. M. B. 221.)

T. coccinea (scarlet).* *fl.*, calyx a minute rim; corolla varying from red to orange-rose, 1in. long, the lobes ¼in. round; racemes 6in. to 18in. long, loose, pendent; bracts and bracteoles ½in. to 1in. long. Spring. *l.* 5in. to 8in. long, the lower ones ovate, the upper ones oblong, obtuse, cordate or angular at the base, acuminate, toothed; petioles ½in. to 2in. long, or wanting in the uppermost leaves. Pendent branches often 10ft. to 25ft. long. India, &c., 1823. A large, nearly glabrous climber. (B. M. 5124; F. d. S. 2447; H. E. F. 195; L. B. C. 1195.)

T. erecta (erect).* *fl.* axillary, solitary; corolla dark blue, with a rich orange throat and pale yellow tube, four times the length of the bracts. July. *l.* opposite, ovate or oblong, smooth, dark green. *h.* 6ft. West Africa, 1857. A very continuous blossomer, producing flowers nearly throughout the whole year. SYN. *Meyenia erecta* (B. H. vii. 18; B. M. 5013; F. d. S. 1093; I. H. iii. 99; R. H. 1863, 251). The variety known as *alba* has white flowers with a yellow tube, but in other respects resembles the type.

T. fragrans (fragrant).* *fl.*, calyx ⅛in. long, twelve to sixteen-toothed; corolla pure white, fragrant, 1¼in. long; pedicels 1in. to 3in. long, one or rarely two in each axil; bracteoles ¾in. long, broadly falcate-oblong. *l.* ovate or oblong, acute or obtuse, cordate or hastate at base, toothed, glabrous when mature, 2in. to 3in. long; petioles ¼in. to 1in. long. Stem slender, climbing, retrorsely hairy or glabrate. India, &c., 1796. (A. B. R. 123; F. M. 325 L. B. C. 1913.)

T. f. lævis (smooth). *fl.*, corolla not fragrant, the tube often greenish; pedicels often two in each axil, much thickened upwards in fruit. Plant glabrous or grey-puberulous. (B. M. 1881, under name of *T. fragrans.*)

T. grandiflora (large-flowered). *fl.*, calyx nearly entire; corolla blue, 2in. to 3in. long and broad; pedicels ½in. to 3in. long, opposite or fascicled; racemes usually stout, rarely slender and elongated, nearly glabrous; lower bracts often petioled, leaf-like. *l.* ovate, or the uppermost ones lanceolate, 6in. long, acute, cordate at base, toothed, often angularly lobed, pubescent, rarely glabrate; petioles 3in. long. India, &c., 1820. A large climber. (B. ii. 76; B. M. 2366; B. R. 495; L. B. C. 324; P. M. B. vii. 221.)

T. Harrisi (Harris'). A synonym of *T. laurifolia.*

T. Hawtayneana (Hawtayne's). *fl.* axillary; calyx a mere ring; corolla violet purple, with a yellowish tube, 1½in. long, nearly glabrous; pedicels short, solitary, with a tuft of hairs at their base; bracteoles ¾in. to 1in. long, ovate-oblong. *l.* sessile, cordate-elliptic or cordate-ovate, acute, entire, 3in. long, 1¼in. broad. Stem slender. India, &c., 1839. A handsome, nearly glabrous climber. SYN. *Meyenia Hawtayneana* (B. iv. 188; P. M. B. vi. 147).

T. Kirkii (Kirk's). *fl.* in short, two-flowered cymes; corolla 1½in. long, the lobes violet-blue, spreading, but not horizontally, broadly obovate, retuse. September. *l.* 1½in. to 3in. long, shortly petiolate, lanceolate, sub-acute or obtuse, entire or with each side dilated into an obtuse lobe. *h.* 2ft. to 3ft. Eastern Tropical Africa, 1876. Shrub. (B. M. 6677.)

FIG. 27. FLOWERING BRANCH OF THUNBERGIA LAURIFOLIA.

T. laurifolia (Laurel-leaved).* *fl.* as in *T. grandiflora* (which this species closely resembles). *l.* elliptic or oblong, acuminate, sinuate or denticulate, palmately three-nerved. India, &c., 1856. Plant glabrous, or the new parts puberulous. Perennial. A tall climber. See Fig. 27. (B. M. 4985; I. H. 1857, 151; R. G. xiv. 475.) SYN. *T. Harrisi* (B. M. 4998; F. d. S. 1275; R. G. ix. 281).

T. mysorensis (Mysore). *fl.*, corolla 1½in. long, the mouth 2in. in diameter, the tube purplish, the limb yellow (in cultivation, sometimes with a red border, as in L. & P. F. G. iii. 88); pedicels ½in. to 1½in. long; racemes elongated, pendent; bracteoles 1in.

Thunbergia—*continued.*

long, falcate-elliptic, often coherent on one side, purplish-green. Spring. *l.* elliptic, acuminate, toothed, cuneate or rounded at base, 6in. long, palmately three-nerved. Branches pendent. Mysore, 1854. An extensive climber. SYN. *Hexacentris mysorensis* (B. M. 4786; F. d. S. 752, 942; L. J. F. iii. 285; R. G. 280).

T. natalensis (Natal). *fl.* horizontally drooping, large, handsome; corolla tube yellow, 2in. long, curved upwards; limb blue, large, the lobes obcordate, horizontally spreading; peduncles axillary, solitary, erect, single-flowered. July. *l.* opposite, the pairs rather approximate, sessile, ovate, acute or sub-acuminate, sinuate-serrate, glabrous above, hairy on the midrib and veins beneath. Stem erect, 2ft. or more high, shrubby below. Natal, 1857. (B. M. 5082.)

T. Vogeliana (Vogel's). *fl.* deep bluish-violet, with a yellow throat, about as large as those of *T. erecta*, but of greater substance. Summer. *l.* large, ovate or oblong, narrowed or rounded at base, dark green. Fernando Po, 1863. A handsome, erect-growing species. SYN. *Meyenia Vogeliana* (B. M. 5389).

THUNIA. Included under **Phaius** (which *see*).

THUYA (from *Thuia*, the old Greek name used by Theophrastus). Arbor-Vitæ. Sometimes spelt *Thuja*. Including *Biota*. *Chamæcyparis* is included, by Bentham and Hooker, under *Thuya*, but for garden purposes it is kept distinct in this work. ORD. *Coniferæ*. A genus comprising about a dozen species of hardy, evergreen trees or shrubs, natives of North America and extra-tropical Eastern Asia. Flowers monœcious; males terminal, solitary; female catkins ovoid or oblong, rarely globose. Leaves small, opposite, scale-like, appressed, quadrifariously imbricated, all sub-equal, or those on the flattened branchlets deeply keeled. Cones ovoid or oblong, rarely globose; mature ones rarely exceeding ½in. in length. The species are readily raised from seeds, sown in spring, under glass, and the seedlings afterwards hardened off and planted out in the open ground. Cuttings, too, of half-ripened shoots, are easily struck; these may be put in heat, under bell glasses, or kept in a cool, shaded frame. About the middle of August is perhaps the best time for propagating without heat. Some of the variegated and other dwarf-growing forms are frequently grafted on seedling stocks of the common types.

T. acuta (acute). A synonym of *T. orientalis*.

T. Doniana (Don's). A synonym of *Libocedrus Doniana*.

T. gigantea (gigantic).* White Cedar. *l.* in alternate, opposite pairs, closely imbricated; those on the branches more distant, decurrent, acute; those on the branchlets very flat, closely placed, irregularly imbricated in four rows, much shorter, more rounded, spiny-pointed. *cones* small, oval, tapering to both ends, nodding, solitary at the extremities of the smaller branchlets. Branches spreading, irregularly scattered; branchlets flattened, short, slender, flexible, undivided. *h.* 50ft. to 150ft. North-west America. A fine, graceful tree. See Fig. 28.

T. g. atrovirens (dark green). Branches spreading; branchlets open, broad, and flat. A fine, robust, very dark glossy-green variety.

T. g. erecta (erect). A much closer and more upright-growing kind than the type.

T. g. pumila (dwarf). A distinct variety, more diffuse in habit than the type, and much smaller in all its parts; the branchlets are also much closer-set, and of a brighter green.

T. g. variegata (variegated). A handsome, variegated variety, with a considerable portion of the branchlets pale yellow, distributed irregularly all over the plant.

T. gigantea (gigantic), of Carrière. A synonym of *Libocedrus decurrens*.

T. lætevirens (pleasing green). A synonym of *Thuyopsis dolabrata lætevirens*.

T. occidentalis (Western).* American Arbor-Vitæ; White Cedar. *l.* very small, in opposite pairs, ovate-rhomboid, blunt-pointed, closely imbricated and flattened, thickly pressed along the branchlets in four rows; those on the older branches more distant, acute, decurrent, dull yellowish-green. *cones* obovate, ½in. long, on short footstalks. Branches distant, horizontal, irregularly scattered along the stem; branchlets laterally spreading. *h.* 40ft. to 50ft. North America, 1596. A large bush or tree. Gordon, in "The Pinetum," enumerates the following varieties:

T. o. alba (white). Tips of the young branchlets silvery-white during spring and early summer.

T. o. argentea (silvery). Some of the branchlets in this variety are silvery-white.

Thuya—*continued.*

T. o. aurea (golden). A nice, golden, self-coloured variety, of American origin.

T. o. compacta (compact). Bagshot Park Arbor-Vitæ. A conical-shaped and very compact variety.

T. o. cristata (crested). Branchlets small, deep green, closely arranged, spreading, frequently recurved, cockscomb-shaped towards the ends of the branches.

T. o. densa (dense). *l.* regularly imbricated, ovate, compressed, glossy-green, quadrifarious. Branches short, stout, compact; branchlets horizontal, flat, fan-shaped, of a rich, glossy colour.

T. o. Elwangeriana (Elwanger's).* *l.* dimorphous, scale-like, and closely imbricated in four rows, or linear, acute, and spreading. Branches sub-erect; branchlets slender. A dwarf-growing, dense bush.

FIG. 28. THUYA GIGANTEA.

T. o. globosa (globular). A dwarf, dense, globular bush, resembling the type except in size.

T. o. gracilis (slender). Branches long and slender, drooping regularly on all sides; branchlets open, rather thinly placed, furnished with rather long, slender, bright green laterals. A distinct variety.

T. o. Hoveyi (Hovey's). *l.* ovate, bright green, closely imbricated. Branches numerous, flat. Spray strap-shaped. A round, compact bush.

T. o. pendula (pendulous). Principal branches along the main stem in a reverted position; branchlets more densely clustered or

Thuya—*continued.*

tufted towards the ends of the branches, and in a more declining position, than in the type.

T. o. variegata (variegated). Some of the branchlets in this variety are pale yellow.

T. o. Vervaeneana (Vervaene's).* Belgian Variegated Arbor-Vitæ. A pretty, gold-tinted variety, with very slender branchlets.

T. o. walthamensis (Waltham Cross).* A very fine, densely pyramidal bush, from 6ft. to 8ft. in height.

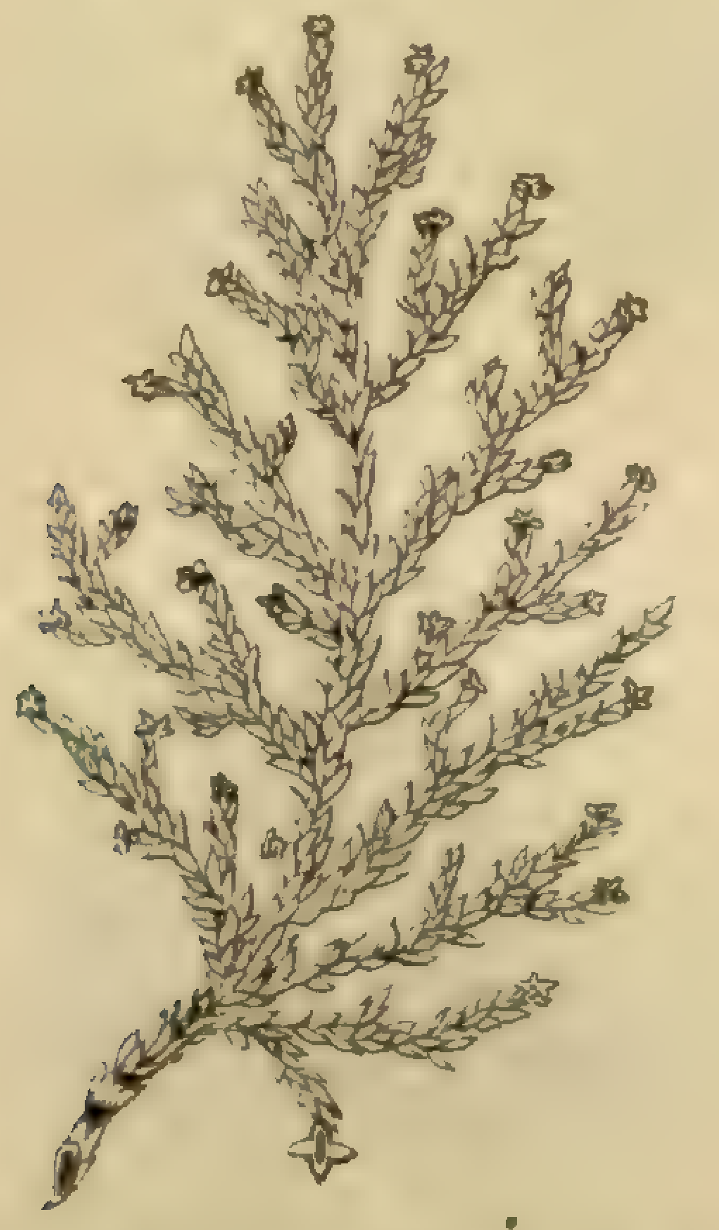

FIG. 29. BRANCHLET, WITH YOUNG CONES, OF THUYA ORIENTALIS.

T. orientalis (Eastern).* Chinese Arbor-Vitæ. *l.* on the adult plant very small, in four rows, ovate-rhomboid, acute, imbricated, adpressed, decurrent, the outer or marginal one lapping over on both sides. *cones* ovate-elliptic, solitary at the ends of the small branchlets, ½in. long, composed of six scales. Branches at first somewhat vertical and horizontal, finally fastigiate; branchlets two-rowed, densely crowded along the extremities of the branches. *h.* 18ft. to 20ft. China and Japan, 1860. A low tree or pyramidal

FIG. 30. BRANCHLET WITH ADULT CONE, OF THUYA ORIENTALIS.

bush. See Figs. 29 and 30. SYN. *T. acuta.* For general garden purposes the best name for this is *Biota orientalis.* Gordon mentions the following varieties, but regards *pendula* as a species:

T. o. argentea (silvery). This only differs from *variegata* in the white colour of a portion of its branchlets.

T. o. ascotensis (Ascot). A very nice, variegated form; a good portion of the upright branchlets are bright golden.

T. o. athrotaxoides (Athrotaxis-like). A dwarf, dense bush, with curiously-contorted branchlets.

T. o. aurea (golden). Branches short, slender, assuming during winter and spring a golden-yellow colour. A very neat, dwarf, dense bush, seldom exceeding 4ft. in height.

T. o. elegantissima (very elegant).* Tips of the young shoots golden-yellow during summer and autumn. The best of the golden-tinted varieties.

T. o. falcata (sickle-shaped). *cones* large. A very upright and pyramidal form, admirably suited for forming edges, to which purpose it is put by the Japanese.

Thuya—*continued.*

T. o. funiculata (rope-like). *l.* small, open, acute. Branchlets slender, little-divided, bright green, thinly furnished with leaves. Said to be a hybrid between the type and *T. o. pendula.*

T. o. glauca (glaucous). *l.* (as well as the branchlets) covered with a fine, glaucous powder, imparting a beautiful silvery appearance to the plant.

T. o. gracilis (slender). This differs from the type in being much slenderer, more compact and erect in all its parts, and in having much smaller and more acute leaves. Nepaul.

T. o. macrocarpa (large-fruited). Branches drooping, slender; branchlets rather distant, alternate, flattened, regularly furnished laterally with small, bright green spray. A dwarf, loose-growing form, supposed to bear somewhat larger cones than the type.

T. o. monstrosa (monstrous). *l.* thickened, ovate, obtuse, rarely acute. Branchlets few, short, gross, much contorted, often four-sided.

T. o. pekinensis (Pekin). *l.* very small, the marginal ones lapping over on both sides. *cones* small, globular, ½in. in diameter, mostly consisting of eight scales. Branches rather long and somewhat spreading; branchlets slender. *h.* 50ft. to 60ft. Pekin, 1861. A splendid tree.

T. o. pendula (pendulous). Weeping Arbor-Vitæ. *l.* in opposite pairs, very small, rather distant, scale-like or ovate-lanceolate, loosely imbricated. *cones* globose or ovate-oblong. Branches spreading, slender, very long, recurved; branchlets thread-like, sometimes forked, loosely drooping. *h.* 10ft. to 15ft. Japan. SYN. *Biota pendula.*

T. o. pyramidalis (pyramidal). A fine variety, with a tall, narrow, fastigiate head; the leaves and branches are more robust than in the type. *h.* 20ft. to 30ft.

T. o. semper-aurescens (always golden). This desirable form resembles *T. o. aurea*, but retains its golden hue throughout the year.

T. o. Sieboldii (Siebold's). Branchlets short, numerous, bright green. Head dwarf, compact, conical.

T. o. triangularis (triangular). Branchlets arranged in a triangular manner, not flat or fan-shaped, as is usually the case.

T. o. variegata (variegated). A very effective variety, the branchlets being bright golden and green, equally intermixed all over the plant.

T. o. Zuccariniana (Zuccarini's). A nice, compact, dwarf variety, globular in form, and bright green, which colour it retains throughout the winter.

T. plicata (folded). *l.* on adult plants ovate, blunt-pointed, regularly imbricated in four rows, quite flat, smooth, bright green above, dull glaucous-green beneath; those on the young plants very much pointed. *cones* small, solitary, nodding, scattered, ovate-oblong. Branches horizontal, rather short, spreading, scattered; branchlets long, straight, linear, regularly pointed. *h.* 20ft. Nootka Sound, 1796. Tree.

T. p. minima (smallest). A compact, miniature variety. Its annual growth does not exceed 1in.

T. p. variegata (variegated). This differs from the type in having a portion of its leaves and lesser spray of a pale yellow, intermixed all over the plant in a variegated manner.

T. Standishi (Standish's). *l.* ovate, blunt-pointed, in opposite pairs, closely imbricated in four rows along the branchlets, deep glossy-green above, dull glaucous-white below. *cones* small, composed of valvate scales. Branches scattered, distantly placed, spreading; branchlets and smaller spray flat, alternate, two-edged, quite straight. Japan, 1861. Tree.

T. tatarica (Tartarian). *l.* in opposite, alternate pairs, closely imbricated in four rows, bluntly oval, somewhat flattened. *cones* similar to those of *T. occidentalis.* Branches thickly set, somewhat horizontal, rather flat, dense, compact, fan-shaped, thickly placed in two horizontal rows along the lesser spray. *h.* 8ft. to 10ft. A dense, conical bush, of garden origin. SYN. *T. Wareana.*

T. tetragona (tetragonal). A synonym of *Libocedrus tetragona.*

T. Wareana (Ware's). A synonym of *T. tatarica.*

THUYOPSIS (from *Thuya*, and *opsis*, resemblance; referring to the affinity of the genus). ORD. *Coniferæ.* A monotypic genus. The species—a tall, hardy, evergreen tree—is included, by the authors of the "Genera Plantarum," under **Thuya** (which *see* for culture).

T. dolabrata (hatchet-leaved).* *l.* in four rows, scale-like, decussate, broad, thick, ovate, rounded at the points, imbricated, furrowed along the middle, deep shining-green above, silvery-white beneath. *cones* small, ovate, sessile, squarrose, consisting of eight to ten woody scales. Branches vertical, open, pendulous at the ends; branchlets two-edged, very numerous, alternate. *h.* 40ft. to 50ft. Japan. Tree. See Fig. 31.

T. d. lætevirens (pleasing green). *l.* (as well as the branchlets) light shining green, very small. A very neat, erect, dense

Thuyopsis—*continued.*

bush, seldom exceeding from 4ft. to 5ft. in height. SYN. *Thuya lætevirens.*

T. d. variegata (variegated). This form has a portion of its lesser spray and leaves of a pale yellow colour.

FIG. 31. BRANCHLET, WITH YOUNG CONES, OF THUYOPSIS DOLABRATA.

THYANA. A synonym of **Thouinia** (which *see*).

THYLACANTHA. A synonym of **Angelonia** (which *see*).

THYLACOPTERIS. Included under *Polypodium.*

THYMBRA (the old Greek name used by Dioscorides for Savory). ORD. *Labiatæ.* A monotypic genus. The species is a hardy, suffruticose, rockwork plant, with the habit of *Thymus.* It thrives in sandy, gravelly loam, and requires the protection of a pit in winter. It may be multiplied by seeds, sown in April; or by cuttings, inserted under a handlight, in June.

T. spicata (spike-flowered). *fl.* pale purple; corolla tube exserted; whorls six to ten-flowered, in a short, dense spike or clustered head; bracts ovate or lanceolate, often coloured. June and July. *l.* linear, entire; those of the sterile branches small, obtuse, sub-decussate; those of the fertile ones nearly 1in. long, acute. Branches ascending, 6in. to 12in. long, scarcely pubescent. Mediterranean region, 1699. (S. F. G. 546.)

THYME (*Thymus*). There are two species of *Thymus* cultivated in gardens, namely Common Thyme (*T. vulgaris*) and Lemon Thyme (*T. Serpyllum vulgaris*), for the leaves and tops, which are in constant demand for culinary purposes, the aromatic flavour being generally liked. Thyme is often used as an edging for some part of the kitchen garden, a purpose for which it is admirably adapted until the plants are about three or four years old, when they require to be replaced. Propagation is easily effected by seeds, sown in April, either on a warm border, with a view to transplanting afterwards, or in drills where the plants are intended to form an edging. In either case, a space of 4in. or 6in. should be allowed between every two plants. Division is also a ready method of propagation; it should be done in March or April. The branches will also root readily into the ground, and form plants, if they are covered with a little soil; this is the best way of increasing a stock of Lemon Thyme. A light, rather dry soil, and warm situation, is most preferable for Thyme plants. A stock of branches should be cut when the plants are coming into flower, and suspended in a cool place for using in a dry state.

THYME, BASIL. *See* **Calamintha Acinos.**

THYME, CAT. *A common name for Teucrium Marum* and *T. Polium.*

THYMELÆA (from *Thymos*, Thyme, and *Elaia*, the Olive; in allusion to the Thyme-like foliage and the small, Olive-like fruit). ORD. *Thymelæaceæ.* A genus comprising about a score species of hardy or half-hardy, perennial or rarely annual herbs, sub-shrubs, or small shrubs, mostly inhabiting the Eastern Mediterranean region, but extending as far as the Canary Islands and Persia, a few being also found in Central Asia and Europe. Flowers small, sessile in the axils, fascicled or solitary, hermaphrodite or by abortion polygamous; perianth urceolate or rarely (especially in the male flowers) with a slender, cylindrical tube, the lobes four, spreading; stamens eight, on very short filaments; bracts small. Leaves scattered, often small or narrow. The two best-known species are here described. Both thrive in a compost of equal parts loam and peat. Propagation may be effected by cuttings. Matured shoots or side growths should be selected, in autumn, inserted thinly in well-drained pots of peaty soil, and covered with a bell glass. If kept in a cool house in winter, they will callus, and may, early in spring, be introduced to gentle heat, to encourage growth and the emission of roots. The young plants may then be potted singly, and grown on in a close, but not high, temperature, and afterwards hardened and kept quite cool during the following autumn and winter, in order to thoroughly ripen the wood.

T. hirsuta (hairy). *fl.* white; fascicles axillary or terminal, few-flowered, equalling the leaves. July. *l.* coriaceous, ovate, nearly round, or oblong, obtuse, nerveless, two to three lines long, glabrous above, white-tomentose beneath. Stems 1ft. to 2ft. long, slender, fastigiate-branched. Mediterranean region, 1759. A decumbent, greenhouse or half-hardy shrub. SYN. *Passerina hirsuta* (B. M. 1949; S. F. G. 360).

T. Tartonraira (Tartonraira). *fl.* white, copious, two to five glomerate in the upper axils; bracteoles whitish. June. *l.* coriaceous, obovate or obovate-oblong, nerved, imbricated, five to ten lines long. Branches copious, divaricate, rigid. South Europe, &c., 1640. A small, hardy shrub, wholly silky-canescent, whitish or fulvescent. SYNS. *Daphne Tartonraira, Passerina Tartonraira* (S. F. G. 354).

THYMELÆACEÆ. A natural order of trees or shrubs, very rarely slender, annual herbs, broadly dispersed. Flowers hermaphrodite, or by abortion polygamous or diœcious, regular, capitate or shortly racemose or spicate, rarely solitary; perianth inferior, petaloid or rarely herbaceous; lobes or segments four or five, imbricated in æstivation, simple, or the two inner ones rarely rather smaller; scales equalling, or often twice or rarely thrice as many as, the lobes; stamens as many, or twice as many, as the lobes; filaments filiform, short; hypogynous disk annular, cup-shaped; ovary sessile or shortly stipitate; bracts variable. Fruit nearly always indehiscent, a nut, berry, or drupe. Leaves opposite, or often alternate or scattered, entire, sometimes numerous and small, sometimes ample; stipules absent. The order includes about thirty-eight genera and 360 species. Examples: *Daphne, Gnidia, Lagetta, Phaleria, Pimelea.*

THYME, WATER. *See* **Elodea.**

THYMUS (from *Thymos*, the old Greek name used by Theophrastus for this plant or for Savory). Thyme. ORD. *Labiatæ.* A genus of mostly hardy, small shrubs or under-shrubs, inhabiting Northern temperate regions, but mostly found in the neighbourhood of the Mediterranean. The number of species is variously estimated by different authors as between forty and eighty. Calyx ovoid, ten to thirteen-nerved, bilabiate, the upper lip three-toothed, the lower bifid; corolla tube naked within, the limb obscurely bilabiate, the upper lip straight and notched, the lower one trifid; stamens four, usually exserted; whorls often few-flowered, distant and axillary or spicate. Leaves small, entire; floral ones conformed, or changed to bracts on the spikes. The species are not possessed of much beauty. They are of simple culture in ordinary soil. Increased by divisions, by slips, by cuttings, or by seeds, sown in March or April. Other species formerly included here will be found under **Calamintha.**

Thymus—*continued.*

T. Chamædrys (Chamædrys). *fl.* light purple, sub-capitate, generally with several separate whorls beneath the terminal head. Summer and autumn. *l.* oval, elliptic-oval, or oblong-elliptical, generally rather abruptly contracted into the petiole. Stems wiry, ascending, slightly branched. Europe (Britain), &c. (Sy. En. B. 1044.)

T. C. lanuginosus (woolly). A pretty form in which the leaves and young shoots are clothed with long, woolly hairs.

T. C. montanus (mountain-loving). *l.* larger than in the species. Branchlets longer and more erect. (B. M. 2666, under name of *T. nummularius.*)

T. citriodorus (Lemon-scented). A synonym of *T. Serpyllum vulgaris.*

T. nummularius (Moneywort-like). A synonym of *T. Chamædrys montanus.*

T. Serpyllum (Serpyllum). Brotherwort; Wild Thyme. *fl.* rose-purple, ¼in. to ⅜in. long, on very short pedicels; whorls capitate; bracts leafy. June to August. *l.* green, flat, quite entire, ⅛in. to ¼in. long. Stems decumbent. Rootstock woody. Europe (Britain), &c. (Sy. En. B. 1043.)

T. S. vulgaris (common). Lemon Thyme. *l.* smaller, with very prominent veins. This is sometimes called *T. citriodorus. See also* **Thyme.**

T. striatus (striated). *fl.*, calyx teeth rigid, pungent; whorls closely approximating in an oblong head. *l.* sub-sessile, linear, rigid, narrowed at base, glabrous, ciliated; floral ones broadly cordate-ovate, striated, pubescent. Floriferous branches ascending. Greece. Half-hardy, procumbent shrub. SYN. *T. Zygis* (S. F. G. 574).

T. vulgaris (common). Garden Thyme. *fl.* resembling those of *T. Serpyllum*, but often smaller. June. *l.* sessile, ¼in. to ½in. long, linear- or ovate-lanceolate, acute, the margins revolute. *h.* 6in. South Europe, 1548. (B. M. Pl. 205.) For culture, &c., *see* **Thyme.**

T. Zygis (Zygis). A synonym of *T. striatus.*

THYRSACANTHUS (from *thyrsos*, a thyrse, and *Acanthus*; in allusion to the form of inflorescence). Thyrse Flower. SYN. *Odontonema.* ORD. *Acanthaceæ.* A genus comprising about a score species of stove, erect herbs or shrubs, natives of tropical America. Flowers red, fascicled in the axils of the bracts, pedicellate; calyx short, somewhat five-parted; corolla tube elongated; limb sub-bilabiate, four-cleft; stamens two, affixed above the middle of the tube; fascicles or cymes disposed in a thyrse. Leaves opposite, entire, often large. The species known to cultivation are described below. They thrive in a compost of about equal parts of loam and leaf soil. Propagated by cuttings, inserted, preferably in single pots, in spring, and placed in a close, warm frame. Young plants should be pinched, to encourage a bushy growth. Some of them may be cultivated in frames during the summer, but require a stove temperature in winter.

T. barlerioides (Barleria-like). *fl.*, corolla 1in. to 1½in. long, glabrous, the lobes ovate, obtuse; thyrse sub-sessile, composed of approximate whorls, 2in. to 7in. long, many-flowered, dense, interrupted at base; bracts ½in. long, subulate-acuminate. *l.* 6in. to 9in. long, 1¾in. to 3in. broad, sessile, shortly attenuated at apex, argutely acuminate, terminal. Stem erect, succulent. Minas Geraes. A pubescent perennial. (F. d. S. 986.)

T. bracteolatus (bracteolate).* *fl.*, corolla ½in. long, pubescent-viscidulous, the upper lip bifid; thyrse pubescent, terminal, narrow; bracts lanceolate-subulate; bracteoles subulate; lower peduncles three or many-flowered, upper ones one-flowered. July and August. *l.* oblong-lanceolate, long-acuminate, shortly petiolate, glabrous, shining, subulate, 4in. to 6in. long, 1in. to 2in. broad. Branches acutely tetragonal. *h.* 2ft. New Grenada, 1823. Shrub. (B. M. 4441.)

T. callistachyus (beautiful-spiked).* *fl.*, sepals pubescent, bristly-acuminate; corolla glabrous, the segments glandular within; upper lip bilobed, the lower one much deflexed; inflorescence straight, naked, the axis tomentose. July and August. *l.* oblong, petiolate, wrinkled, acute, below (as well as the branches) tomentose. Mexico. *h.* 2ft. Shrub. (L. J. F. 165; L. & P. F. G. ii. 53; R. G. 1054.) SYNS. *T. lilacinus, Justicia lilacina* (of gardens).

T. indicus (Indian). *fl.*, calyx deeply five-cleft, the segments erect; corolla white, with a few purple lines, funnel-shaped, the mouth oblique, the limb obscurely bilabiate, the segments spreading-reflexed; thyrse terminal. April. *l.* opposite, about 3in. long, oblong-lanceolate, pinnate-veined, acuminate, entire, dark green, gradually tapering at base into a short petiole. Stem and branches tetragonal. *h.* 2ft. Bhotan, 1857. Shrub. (B. M. 5062.) The correct name of this plant is *Asystasia bengalensis.*

Thyrsacanthus—*continued.*

T. Lemaireanus (Lemaire's). A synonym of *T. strictus.*

T. lilacinus (Lilac-flowered). A synonym of *T. callistachyus.*

T. nitidus (shining). *fl.*, corolla ½in. long, slightly bilabiate; lobes drooping, sub-equal, oblong, rather blunt, about as long as the tube; fascicles somewhat distant; raceme compound at the base. *l.* oblong or lanceolate-oblong, acuminate, 3in. to 8in. long, tapering into the short petioles. *h.* 3ft. to 4ft. West Indies. Shrub. SYN. *Justicia nitida* (A. B. R. 570).

T. rutilans (reddish).* *fl.* solitary in the axils of the bracts; corolla tubular-ventricose, the lobes sub-equal, erose; raceme terminal, axillary, 8in. to 10in. long, twelve to sixteen-flowered, nodding. Winter and spring. *l.* sessile, oblong-lanceolate, acuminate, acute, narrowed at base, obsoletely erose-denticulate on the margins, paler beneath, sparsely pilose on both sides. *h.* 2ft. Columbia, 1851. Shrub.

T. rutilans (reddish), of gardens. A synonym of *T. Schomburgkianus.*

T. Schomburgkianus (Schomburgk's).* *fl.* brilliant crimson, distant, opposite; corolla 1in. long, with a nearly regular limb, the segments ovate, scarcely spreading; raceme terminal, elongated, long-pedunculate, glandular-pubescent. Winter and spring. *l.* oval-oblong, cuspidate-acuminate, 8in. to 12in. long. Branches sub-tetragonal, with smooth angles. *h.* 3ft. New Grenada, 1855. Shrub. (B. M. 4851.) SYN. *T. rutilans* (B. H. 1865, p. 97; F. d. S. 732; L. & P. F. G. iii. p. 73).

T. strictus (straight). *fl.* all fascicled; corolla nearly 1in. long, with an oblique, nearly regular limb, the segments oblong, acute; whorls approximate, adpressed; thyrse terminal, elongated, straight, simple, narrow, 1ft. long; bracts subulate, nearly equalling the pedicels. February and March. *l.* oblong, acuminate, acute at base, shortly attenuated into the petioles. Stem simple, elongated. *h.* 3ft. Honduras, 1840. A glabrous shrub. (B. M. 4378.) SYNS. *T. Lemaireanus, Aphelandra longiscapa* (of gardens), *Eranthemum coccineum* (F. d. S. 240), *Justicia longiracemosa* (of gardens), *Salpingantha coccinea* (of gardens).

THYRSANTHUS. A synonym of **Wistaria** (which *see*).

THYRSE. A panicle whose principal diameter is midway between the base and apex.

THYRSE FLOWER. *See* **Thyrsacanthus.**

THYRSOID. Resembling a thyrse.

THYRSOPTERIS (from *thyrsos*, a bunch or raceme, and *Pteris*, a Fern; the fructification is disposed in racemose bunches). ORD. *Filices.* A monotypic genus. The species is a handsome, but very rare, greenhouse Fern. For general culture, *see* **Ferns.**

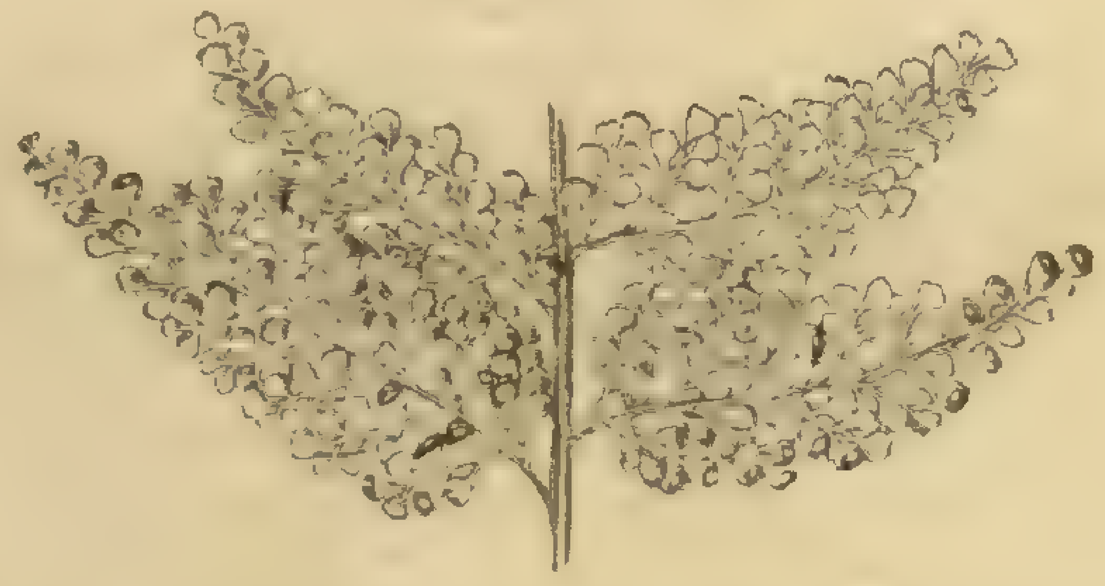

FIG. 32. PORTION OF FERTILE FROND OF THYRSOPTERIS ELEGANS.

T. elegans (elegant). *cau.* arborescent. *fronds* decompound, attaining a length of 5ft. to 6ft., one-third of which is naked; sterile portions bipinnate, with lanceolate, incised pinnules; fertile parts tripinnate, each pinna becoming a raceme of stalked involucres. *sori* globose; involucre cup-shaped. *h.* 15ft. Juan Fernandez, 1854. See Fig. 32.

THYRSULA. The little cyme borne by the majority of the *Labiatæ* in the axils of their leaves.

THYSANOTUS (from *thysanotos*, fringed; alluding to the three elegantly-fringed inner perianth segments). Fringed Violet; Fringe Lily. SYN. *Chlamysporum.* Including *Isandra.* ORD. *Liliaceæ.* A genus including nineteen species of greenhouse perennials, all Australian, one extending to the Philippine Islands and South China. Flowers umbellate, rarely solitary; perianth marcescent, persistent, of six segments, the outer ones narrow, the inner ones with broad, coloured margins,

Thysanotus—*continued.*

and fringed on the edges; stamens six, or sometimes three; bracts short, imbricated; scapes leafless or nearly so, simple or variously branched. Leaves radical, grass-like. The following species have been introduced, and are very elegant subjects when in flower. They thrive in sandy loam, and may be increased by offsets.

T. dichotomus (dichotomously branched). *fl.* one, two, or rarely three, in terminal umbels; perianth segments purple; stamens six. July. *l.*, radical ones few, short, withering early. Stems very variable, sometimes erect, branched, 1ft. to 2ft. high, rarely almost twining. Rhizome thick, fibrous. 1838. (B. R. 1840, 14, under name of *T. intricatus.*) *T. tenuis* is probably a reduced form of this species. (B. R. 1838, 50.)

T. elatior (tall). A form of *T. tuberosus.*

T. intricatus (intricate). A synonym of *T. dichotomus.*

T. isantherus (even-anthered). A synonym of *T. tuberosus*

T. junceus (Rush-like).* *fl.* one to three in terminal umbels, and sometimes one or two sessile along the lower branches; perianth segments purple, five to six lines long; stamens six. August. *l.*, radical ones few, narrow-linear, short, soon withering. Stems slender, loosely branched, erect or flexuous, 1ft. to 2ft. high, bearing sometimes a short leaf near the base. Rhizome thick, fibrous. 1804. (B. M. 2351; B. R. 656.)

T. multiflorus (many-flowered). *fl.*, perianth segments purple, the outer ones very acute, the inner ones rather shorter; stamens three; scapes simple, 6in. to 18in. high, bearing a single, terminal, many-flowered umbel or rarely a second one lower down. August. *l.* all radical, densely tufted, erect, rigid, much shorter than the scape. Stock densely tufted, with fibrous roots.

T. m. prolifer (proliferous). A luxuriant form, having a large, terminal umbel, frequently a second one rather lower down, and leaves sometimes exceeding the scape. (B. R. 1838, 8, and F. d. S. 1911, under name of *T. proliferus.*)

T. proliferus (proliferous). A synonym of *T. multiflorus prolifer.*

T. tenuis. *See* **T. dichotomus.**

T. tuberosus (tuberous-rooted).* *fl.*, perianth purple, sometimes six to seven lines long; stamens six; scape erect, rigid, terete, 6in. to over 12in. high, branching into a loose, irregularly dichotomous panicle, each branch having a terminal umbel of one to four flowers, and sometimes a lateral, sessile one. June. *l.* radical, not numerous, narrow-linear, very short or as long as the scape. Fibrous roots swollen into tubers. 1825. (B. R. 655, under name of *T. isantherus.*) *T. elatior* is a tall, strong, many-flowered form of this species.

FIG. 33. TIARELLA CORDIFOLIA, showing Habit and detached Flower.

TIARELLA (from *tiara*, a Persian diadem; alluding to the shape of the capsules). ORD. *Saxifrageæ.* A genus including five species of hardy, erect, slender, perennial herbs; one is a native of the Himalayas, and the rest are North American. Flowers white, on slender pedicels; calyx tube short, the limb five-lobed; petals five, entire; stamens ten, the filaments elongated; racemes terminal. Leaves mostly radical, long-stalked, simple or trifoliolate; stipules small, adnate with the petioles. *T. cordifolia* is the best-known species. It thrives in ordinary soil, and is well suited for rockwork, or for the front of the flower border. Increased by divisions.

T. cordifolia (heart-shape-leaved).* False Mitrewort. *fl.* white; petals oblong, clawed; raceme simple; scapes 6in. to 12in. high. April. *l.* cordate, acutely lobed, unequally mucronate-toothed, hirsute above, pubescent beneath. Stem thick, sending out creeping stolons after flowering. North America, 1731. See Fig. 33. (B. M. 1589.)

T. Menziesii (Menzies'). A synonym of *Tolmiea Menziesii.*

TIARIDIUM. Included under *Heliotropium.*

TIBOUCHINA. Included under *Pleroma.*

TICKLE MY FANCY. *See* **Viola tricolor.**

TICKS. These belong to the same group as Mites, viz., the *Acarida*, and are not insects, in the strict sense, at all. They are fairly numerous, and have been placed under several genera, included in the family *Ixodidæ*, which takes its name from the chief genus, *Ixodes.* To this genus almost all the British Ticks belong. They all live in woods and thickets, or upon low herbage, apparently feeding, for a time at least, on the juices of plants; but all Ticks seek to attach themselves to the bodies of passing animals; and, once attached, they bury their proboscis in the animal's skin, and live there for the rest of their lives, unless dislodged, sucking blood, and growing rapidly. It has been supposed that each species is parasitic upon a single species of animal; but though each usually shows a preference for some one species of host, they are able to subsist on others also, and all animals, from man downwards, are liable to their attacks. Dogs are peculiarly troubled with them; and in Britain, the one known as the Dog-tick (*I. erinaceus*) is common on dogs, cattle, &c.

In general appearance, Ticks are much alike, all being covered by a tough skin, with no division into segments. They are usually ovate or elliptical in form; each of their eight legs ends in a sucker and two claws, giving a firm grasp; and the head bears a barbed snout, which, once buried under the skin, cannot be withdrawn. The palpi, or feelers, at the sides of the mouth, contain two tubes for sucking in the fluid food. Some Ticks have eyes, others have none. Each bears a small, horny shield on the back, behind the head. The largest species, when full of blood, may become as large as a common bean; but few reach this size.

Ticks sometimes cause much annoyance to gardeners in autumn, by fixing themselves to the skin, in the manner described above. They can be got rid of by washing the affected parts with an infusion of tobacco, which stupefies them, and weakens their hold on the skin, so that they can be readily removed. If Ticks are carelessly pulled off, the head and fore limbs are often left in the wound, and are apt to cause annoying sores, if not removed at once.

TICOREA (the name of *T. fœtida* in Guiana). SYNS. *Ozophyllum, Sciuris.* ORD. *Rutaceæ.* A genus embracing about half-a-score species of stove trees or shrubs, natives of Brazil and Guiana. Flowers white, yellowish-white, or scarlet, on bracteate pedicels; calyx short, four or five-lobed; corolla tubular-infundibular, the tube elongated, the limb of five valvate lobes; disk cup-like or urceolate; stamens five to eight; panicles or cymes terminating the branchlets, rarely axillary, leafless. Leaves opposite or alternate, simple or consisting of one to three entire, pellucid-dotted leaflets. Two species have been introduced. They thrive in a compost of peat, loam, and sand. Propagation may be effected by ripened cuttings, inserted in sand, under a glass, in heat.

Ticorea—*continued.*

T. fœtida (fœtid). *fl.* white, six or seven in a corymb, sessile along the branches; petals six times longer than the calyx. February. *l.* consisting of three equal, almost sessile leaflets, which, when bruised, emit a disagreeable smell. *h.* 10ft. Guiana, 1825. Shrub. (A. G. 277.)

T. jasminiflora (Jasmine-flowered). *fl.* white, sessile along the branches of the rather loose panicle. September. *l.* consisting of three lanceolate, acuminate, tapering leaflets. *h.* 20ft. Brazil, 1827. Tree.

TIGAREA. A synonym of **Purshia** (which *see*).

TIGER IRIS. *See* **Tigridia.**

TIGER LILY. *See* **Lilium tigrinum.**

TIGER MOTHS. A name commonly applied to several moths of the tribe *Bombycina* (*see* **Moths**), probably on account of the bright, variegated colours of its more conspicuous members. The larvæ of all the Tiger Moths are rather thick-bodied, and are closely covered with long, stiff hairs, usually brown or black, rising from numerous prominent warts along the back and sides. They feed on low plants, chiefly herbs, and seldom do much harm in gardens, as they prefer Dock, Plantains, and other weeds, rather than cultivated plants. In autumn, and again in spring, the larvæ of the Common Tiger, and of the Ruby Tiger, are to be seen on every road, crawling in search of food or of safe retreats for the winter, or for pupation. When full grown, in spring or early summer, they spin slight cocoons on the food-plants, or among dead leaves and surface rubbish, and in them become pupæ, from which the moths emerge in two or three weeks. The species of most common occurrence in gardens are the two just mentioned.

The common Tiger (*Arctia caja*) varies in size from 2in. to 3in. across the fore wings, which are brown, with irregularly branching, pale cream-coloured lines and spots. The hind wings are red, with six or seven blue-black spots, of which three lie in a band parallel to the hind margin. The head is brown, with a crimson collar; the thorax is brown; and the abdomen is crimson, with a series of oblong, black spots down the middle, and a row of black dots along each side. This species is very apt to vary in the colour of the wings; in some the dark tints prevail, in others the pale. The larva of this Moth is known generally as the "Woolly Bear," from its dense coat of long hairs. The latter, on the back, are dark near their bases, grey near the tips; along the sides and near the head they are brown. The larvæ hybernate while small, and feed up in spring, when they subsist on a great variety of plants in gardens. The moths usually emerge about July.

The Cream-spotted Tiger Moth (*Arctia villica*) is a little like *A. caja*, but smaller, as it does not exceed 2½in. in spread of fore wings. This species is black, with

FIG. 34. CREAM-SPOTTED TIGER MOTH.

eight cream-coloured spots (see Fig. 34). The hind wings are orange-yellow, with a few small, central, black spots, and an irregular, black band along the hind margin. The larva is a good deal like the "Woolly Bear," and, like it, feeds on various herbs.

The "Wood Tiger" (*Nemeophila Plantaginis*) seldom exceeds 1½in. across the fore wings. These are black, with pale spots, passing into yellow at the margins.

Tiger Moths—*continued.*

The hind wings are dull, deep yellow or orange, with velvety-black markings, in the form of black spots, along the hind margin, and at the base. The larva is hairy; the hairs near the end of the body are black, those in the middle of the body are red-brown. It feeds on low weeds, and is scarcely ever seen in gardens, as this moth frequents moors.

The Scarlet Tiger (*Callimorpha Dominula*) is confined to localities where the Hound's-tongue (*Cynoglossum*) grows. It reaches about 2¼in. across the fore wings, which are dark olive-brown, with a metallic-green lustre, and bear about ten spots, those in the centre yellow or orange, the others cream-coloured. The hind wings are crimson, with large, black spots near the margins.

The Ruby Tiger (*Phragmatobia fuliginosa*) differs from all the above alike in size (about 1¼in. across the front wings) and in colour. The fore wings are dull red-brown, with two black dots near the middle. The hind wings are dull pink near the base, smoky-brown near the margin, and have two dark dots near the middle; the fringes are pink. The head and thorax are brown; the abdomen is pink, with one central and two lateral rows of dark spots. The larvæ are yellowish-brown, smoke-coloured, or dark, and very hairy. They are often to be seen in autumn, seeking secure retreats for the winter, and in spring they emerge from their retreats to feed up. In April or May they spin loose, oval cocoons among herbage, and become dark pupæ; from these the moths emerge in June. The larvæ feed chiefly on low weeds, but may at times live on garden produce.

All the Tiger Moths have thick, heavy bodies. They fly at all hours by day, and also by night.

Should the larvæ ever become too numerous, hand-picking is the best remedy.

TIGLIUM. Included under *Croton.*

TIGRIDIA (from *tigris*, a tiger, and *eidos*, like; in reference to the spotted flowers). Mexican Tiger Flower; Tiger Iris. SYNS. *Beatonia*, *Hydrotænia*. ORD. *Irideæ*. This genus includes about seven species of greenhouse or half-hardy, bulbous plants, from Mexico, Central America, Peru, and Chili. Flowers few in a spathe, in one species (*T. pavonia*) very large; perianth concave, with no tube; segments free, the outer ones very broad, unguiculate, the inner ones much smaller and erecto-patent, often obtuse, more or less undulated; filaments connate in a cylindrical tube; spathe one, terminal, or two at the axils of the floral leaves, long and unequally pedunculate. Leaves at base of stem few, narrow, or broader and plicate-veined; cauline or floral ones often two or three, scattered. *T. pavonia* and its varieties are very handsome subjects when in flower. All the species thrive best in a light, sandy soil; if planted outside, a warm, sunny position, with south aspect, should be accorded them. The roots must be lifted in the autumn, when the leaves have died down, stored away in some place where frost cannot reach them, and re-planted in the following April. Propagation may be effected either by seeds or by offsets.

T. atrata (dark).* *fl.*, perianth dark purple; outer segments with pale green-spotted claws and a dark brown lamina; spathe two-valved, 2½in. long. April. *l.* plicate, 1ft. to 1½ft. long. Stem 2ft. high. South Mexico, 1843. Greenhouse.

T. conchiflora (shell-flowered). A synonym of *T. pavonia conchiflora.*

T. curvata (curved). *fl.*, perianth yellowish, spotted with purple; peduncles curved; spathe one-valved. April. *l.* plicate, 8in. long. Stem slender, 1ft. high. Real Del Monte, 1843. Greenhouse.

T. lutea (yellow). *fl.* pedicellate, fragrant; perianth yellow, obscurely dotted, the outer segments obovate, 1in. long, obscurely crenate on the margins, the inner ones exappendiculate; spathe terminal, five or six-flowered, bivalved. June. *l.* ensiform, amplexicaul, very long-acuminate. Stem terete, glabrous, arching, 8in. to 10in. long. Peru, 1843. Half-hardy. (B. M. 6295.)

Tigridia—*continued.*

FIG. 35. INFLORESCENCE OF TIGRIDIA MELEAGRIS.

T. Meleagris (Meleagris).* *fl.* in colour and form resembling *Fritillaria pyrenaica*, four or five in a leafy, convolute spathe 2½in. long; segments marked with a few broken bands of crimson, slightly unguiculate. Spring. *l.* solitary, straight-veined, plaited. Stem about 1½ft. high. Mexico. Greenhouse. See Fig. 35. SYN. *Hydrotænia Meleagris* (B. R. xxviii. 39).

T. pavonia (peacock-spotted).* Flower of Tigris; Peacock Tiger Flower. *fl.* on elongated pedicels; perianth golden-orange, the outer segments broadly ovate, 3in. long, mucronate at apex, the inner ones 1½in. long, concave-channelled below the middle; spathe three-flowered, 4in. long. June. *l.* lanceolate-ensiform, plicate, acute; radical ones distichous, 10in. to 18in. long, sheathing at base. Stem cylindrical, dichotomous, leafy, 1ft. to 2ft. high. Mexico, 1796. Half-hardy. SYNS. *Ferraria Pavonia* (A. B. R. 178; L. B. C. 1424), *F. Tigridia* (B. M. 532).

T. p. albiflora (white-flowered).* In this variety, the ground-colour of the perianth is a beautiful white.

T. p. conchiflora (shell-flowered). A rather dark yellow-flowered form. SYN. *T. conchiflora* (F. d. S. 908, fig. 2; S. B. F. G. 128).

T. p. speciosa (showy). In this form, the ground-colour is deeper and brighter than in the type. (F. d. S. 908, fig. 1.)

T. Van Houttei (Van Houtte's).* *fl.* issuing from spathes which terminate the branches of the stem; perianth about 1½in. across, the outer and larger segments yellow, with a broad basal blotch and marginal veins of purple, the inner segments lilac, veined with purple. Spring. *l.* few, ensiform, plaited; upper ones shorter. *h.* about 1ft. South Mexico, 1875. Greenhouse. (F. d. S. 2174.)

T. violacea (violet). *fl.*, perianth violet, campanulate, nodding, the blade of outer segments rose-purple, the claw white, dotted with rose-purple, ¾in. long; inner segments deflexed, white, dotted in the middle; spathe three or four-flowered, two-valved. May. *l.* ensiform, plicate-nerved; radical ones 8in. to 14in. long. Stem terete, erect, 7in. to 14in. high, dichotomous at apex. South Mexico, 1838. Greenhouse. SYN. *Beatonia purpurea.*

TIGRIS, FLOWER OF. An old name for *Tigridia Pavonia.*

TILE-ROOT. *See* **Geissorhiza.**

TILESIA. A synonym of **Wulffia** (which *see*).

TILIA (the old Latin name for the Lime, used by Virgil and Pliny). Lime-tree; Linden. ORD. *Tiliaceæ.* This genus includes about eight species of ornamental, lofty-growing, hardy, stellate- or simply-pubescent trees, inhabiting the temperate regions of the Northern hemisphere. Flowers white or yellowish; sepals five; petals five, naked or furnished with petaloid scales on the inside; stamens numerous, free or irregularly disposed in bundles; bract of the peduncle leaf-like, adnate for half its length; cymes axillary or terminal. Fruit globose, nut-like, indehiscent, one or two-seeded. Leaves often obliquely cordate, serrated. Several species are grown in this country, one being a native. The flowers contain a quantity of honey, and are consequently haunted by bees. Russian Bass or Bast Mats, so well known to gardeners, are prepared from the inner bark of various species. The smooth, light, delicately-white, and uniform wood of *T. platyphyllos* and *T. vulgaris* is in great demand by carvers, turners, and musical instrument makers.

Culture, &c. A good, loamy soil is suited to the requirements of Limes. In dry situations, the species never attain a large size, and they lose their leaves earlier than any other tree. Being a tree of the plains, rather than of the mountains, the Lime does not appear suitable for very exposed situations. Propagation is usually effected by layers, which are made in the nurseries, in autumn and winter, and become rooted, so as to admit of being taken off, in a year. Seeds are seldom ripened in this country; when obtainable, they should be sown immediately after being gathered, but the raising of plants by this means is an exceedingly slow process. Du Hamel states that "the French gardeners, when they want a supply of young Lime-trees, cut over an old one close by the surface of the ground, which soon sends up a great number of shoots: among these they throw in a quantity of soil, which they allow to remain one, two, or three years; after which they find the shoots well rooted, and of a sufficient height and strength to be planted at once where they are finally to remain." This mode is still practised in France and Belgium, both with the Lime and the Elm. The Lime-tree bears transplanting when of a considerable size; but when grown for this purpose, it should be taken up and replanted every two or three years. Trees that have stood some years without being removed should have the roots cut round, at from 3ft. to 4ft. from the stem, a year before transplanting, in order to stunt the growth, both of the head and roots, and to induce the production of smaller roots and fibres. The different cut-leaved and variegated forms are usually increased by grafting on strong plants of any of the common species.

Insects, &c. Of foes to the Lime-tree, only a few do so much injury as to call for detailed notice here. The bark and wood are liable to attacks by Beetles, though healthy trees seldom suffer thereby. The caterpillars of several kinds of Moths, most of them small, frequently disfigure the leaves by drawing them together by webs, or rolling them to form tubes, and by eating large holes in them. The more destructive species belong to the Winter Moths, the females of which either have no visible wings, or have them so small as to be useless (*see* **Hybernia** and **Winter Moth**). Their ravages may be lessened by shaking the branches, and collecting the caterpillars when they drop from their tubes; or, yet more effectually, by interposing an obstacle, *e.g.*, a belt of tar, in autumn and winter, round the foot of the tree, to prevent the ascent of the female moth to lay her eggs.

Lime-trees are very liable to be injured by the growth of galls on the younger parts. A Gall-midge (*Cecidomyia floricola*) often makes galls on the branches or leaf-stalks, in the form of swellings about the size and form of a small pea, in the centre of which the larvæ may

Tilia—*continued.*

be found. The leaves are very liable to be galled by Mites of the genus *Phytoptus*. These Mites are extremely small, requiring a considerable magnifying power to show them; but the genus is easily recognised by having only four legs, instead of eight, as in other Mites, and by being gall-makers—a mode of life not shared by other Mites. The Mites do not in themselves afford characters by which the species can be clearly distinguished from one another; but the galls made by them are very constant in form and aspect, so that they can be readily recognised. On Lime leaves there may be found three at least, very distinct from one another. The first resembles small nails, and has received the popular name of Nail-galls. It has also received the name of *Ceratoneon extensum*. Frequently, many of these galls stand on almost every leaf of the tree. Another gall is in the form of small, round, hard warts, at the origin of the larger leaf-veins; while the third forms velvety patches, ¼in. to ¾in. across, on the lower surface of the leaves, so much resembling a Fungus that it was at one time described as such under the name *Erineum tiliaceum*. It consists of a patch of hairs, between which the Mites live. The hairs are at first white, but show a tendency to become brown.

Except where very numerous, these galls can hardly be regarded as doing much harm to the trees. The most likely method of limiting their attacks is to remove the affected leaves or branches, and to destroy them, as soon as possible after the first appearance of any of the galls on a plant.

T. alba (white). A synonym of *T. argentea*.

T. a. pendula (white weeping). A synonym of *T. petiolaris*.

T. americana (American). American Basswood or Whitewood. *fl.* yellowish-white; petals truncate and crenate at apex, equalling the style, furnished with scales. July and August. *fr.* yellow, the size of a large pea. *l.* deeply cordate, abruptly acuminate, sharply serrated, somewhat coriaceous, glabrous, turning yellowish-brown in decay. *h.* 60ft. to 70ft. North America, 1752.

T. a. pendula (weeping). A garden synonym of *T. petiolaris*.

T. a. pubescens (downy). *fl.* pale yellow. June. *l.* 3in. to 4in. in diameter, the under surface, when young, rather paler than the upper, but at length nearly the same colour; serratures broad and short. *h.* 50ft. to 70ft. 1726.

T. argentea (silvery).* White or Silver Lime. *fl.* yellowish-white, very fragrant; petals each with a scale on the inside. June to August. *fr.* yellow, evidently ribbed. *l.* cordate, somewhat acuminate, rather unequal at base, serrated, smooth above, white-downy beneath, four times the length of the petioles. *h.* 30ft. to 50ft. Eastern Europe, 1767. (W. D. B. 71, under name of *T. alba.*)

T. a. pendula (weeping). A synonym of *T. petiolaris*.

T. cordata (heart-shaped). *fl.* yellowish-white; petals without a scale at their base. Summer. *fr.* crustaceous-pubescent, globose or ellipsoid, faintly-ribbed. *l.* glabrous, glaucous, and pubescent, in the axils of the nerves beneath. Europe and Siberia. A small tree, generally with leaves smaller in size than those of either *T. platyphyllos* or *T. vulgaris*. This is the last of the three to flower. It is found here and there in woods in Britain, and is regarded by some authorities as a truly indigenous species. SYNS. *T. microphylla*, *T. parvifolia* (Sy. En. B. 287), *T. ulmifolia*.

T. dasystyla (thick-styled).* *fl.*, lower part of the pyramidal style tomentose and persistent as a point. Summer. *l.* large, obliquely truncate at base or sometimes sub-cordate, slightly hairy beneath and bearded in the axils of the nerves. Buds glabrous. *h.* 30ft. to 60ft. South Tauria, 1884.

T. europæa. *See* **T. platyphyllos** and **T. vulgaris.**

T. e. laciniata (torn). A synonym of *T. platyphyllos asplenifolia*.

T. grandifolia (large-leaved). A synonym of *T. platyphyllos*.

T. heterophylla (variable leaved). American White Basswood. *fl.* greenish-yellow, few in a loose cyme; petals obtuse, crenulated. July and August. *l.* 4in. to 8in. in diameter, very oblique, more or less cordate, abruptly acuminate, green and somewhat shining above, very white and velvety-tomentose and conspicuously veined beneath. *h.* 30ft. to 50ft. North America, 1811.

T. intermedia (intermediate). A synonym of *T. vulgaris*.

T. microphylla (small-leaved). A synonym of *T. cordata*.

T. parvifolia (small-leaved). A synonym of *T. cordata*.

T. petiolaris (petiolate).* *fl.* yellow-green, with five petaloid scales inserted amongst the stamens. July. *fr.* depressed, globose, five-lobed, warted, ⅓in. in diameter. *l.* pale green above, white, hoary-pubescent beneath; petiole as long as, or longer than, the blade. Branchlets pendulous, leafy. Trunk erect. *h.* 50ft. Crimea (?). This greatly resembles the White Lime, but is easily recognised by its much longer leafstalks and its warted fruits. (B. M. 6737.) SYNS. *T. alba pendula*, *T. americana pendula* (of gardens), *T. argentea pendula*.

T. platyphyllos (broad-leaved).* *fl.* yellowish-white; petals without a scale at their base. June. *fr.* obovate, globose, with from three to five prominent ribs when ripe. *l.* downy sometimes on both surfaces, always on the entire under surface. *h.* 70ft. to 90ft. Europe (Britain). This species is the earliest to flower. SYNS. *T. europæa* (in part), *T. grandifolia* (Sy. En. B. 285).

T. p. asplenifolia (Spleenwort-leaved). This has curiously laciniated leaves and is not so vigorous or tall a grower as the type. SYN. *T. europæa laciniata.*

T. p. aurantia (orange). In this form, the bark of the young twigs is of an orange-yellow colour.

T. p. Blechiana (Blech's). *l.* very large. A distinct and vigorous form of garden origin.

T. p. pyramidalis (pyramidal). A form of distinctly pyramidal habit.

T. p. vitifolia (Vine-leaved).* A pretty variety, with lobed, Vine-like leaves. SYN. *T. vitifolia.*

T. ulmifolia (Elm-leaved). A synonym of *T. cordata*.

T. vitifolia (Vine-leaved). A synonym of *T. pyramidalis vitifolia.*

FIG. 36. BRANCHLET, AND DETACHED CLUSTER OF FRUITS, OF TILIA VULGARIS.

T. vulgaris (common).* Lime, Lin, Linden, or Line-tree. *fl.* yellowish-white; petals without a scale at their base. Summer. *fr.* woody, pubescent, not ribbed when ripe. *l.* glabrous above, pubescent in the axils of the veins beneath. Europe, Caucasus (naturalised in Britain). This species begins to flower when *T. platyphyllos* is nearly past. See Fig. 36. SYNS. *T. europæa* (in part), *T. intermedia* (Sy. En. B. 286).

T. v. variegata (variegated). This only differs from the type in having the leaves blotched with dull creamy-white. SYN. *T. europæa variegata.*

TILIACEÆ. A natural order of trees, shrubs, or rarely herbs, broadly dispersed, numerous in the tropics. Flowers regular, hermaphrodite or rarely unisexual,

Tiliaceæ—*continued.*

axillary or terminal, often cymulose; sepals five, rarely three or four, free or connate, often valvate; petals as many or fewer, or none, alternating with the sepals, inserted around the base of the torus, entire or incised; æstivation contorted or variously imbricated, induplicate, or valvate; stamens usually indefinite; filaments free, or connate in a ring of five to ten bundles; anthers two-celled; ovary free, sessile. Fruit two to ten-celled, or, by abortion, one-celled, variable. Leaves alternate, in a few species opposite or nearly so, simple, penninerved or palminerved, entire, toothed, or rarely lobed; stipules twin, usually small and deciduous, rarely larger and persistent or absent. Several of the species in this order furnish materials for making cord. Jute, the fibre of *Corchorus capsularis*, has, of late, become the rival of hemp in the English market, many thousands of tons being annually imported from India. The order comprises about 46 genera and 330 species. Examples: *Aristotelia, Corchorus, Prockia, Tilia, Triumfetta.*

TILIACORA (the Bengalese name). SYN. *Braunea* (in part). ORD. *Menispermaceæ.* A monotypic genus. The species is a stove, evergreen, climbing shrub, thriving in a compost of sandy loam and peat. Cuttings will root readily in sand, under a glass, in heat.

T. racemosa (racemose-flowered). *fl.* yellow; panicles axillary, 6in. to 12in. long, hoary, at length glabrous; branches 1in. long, the males three to seven-flowered, the females simple and one-flowered. May. *fr.*, drupe ½in. long, obovoid, stalked, sub-compressed, red. *l.* 3in. to 6in. long, ovate, acuminate, glabrous, acute, truncate, rounded, or sub-cordate at base, thin, the margins undulated; petioles ½in. to 1in. long. East Indies, 1820.

TILL. Another name for Lentil.

TILLÆA (named in honour of M. A. Tilli, 1653-1740, an Italian botanist). Including *Bulliarda.* ORD. *Crassulaceæ.* A genus comprising about twenty species of aquatic or terrestrial, cosmopolitan herbs. Flowers white or reddish, minute, variously disposed. Leaves opposite, cylindrical, subulate, or flat, entire. *T. muscosa* (Mossy Redshanks) is a British plant. Several exotic species have been introduced, but their interest is of a botanical character only.

TILLANDSIA (named in honour of Elias Tillands, a Swedish botanist, and Professor of Medicine in the University of Abo). SYN. *Renealmia* (of Linnæus). Including *Allardtia, Anoplophytum, Bonapartea, Phytarrhiza, Platystachya, Vriesia,* and *Wallisia.* ORD. *Bromeliaceæ.* A large genus (according to the authors of the "Genera Plantarum," nearly 120 species) of very handsome, stove, epiphytal or rock-loving, very rarely terrestrial, glabrous or often more or less furfuraceous herbs, natives of tropical America, a few extending into North America. Flowers solitary in the bracts; sepals erect, rather rigid, free, closely imbricated; petals free, deciduous, the erect claws connivent in a tube, the blades spreading; stamens free; filaments filiform; anthers oblong-linear, erect, shorter than the petals, or sometimes exserted; bracts variable; spike terminal, simple or compound, rarely reduced to a one-flowered peduncle. Capsules oblong or linear, septicidally three-valved. Leaves narrow, entire. Most of the plants of this genus are epiphytal on trees under natural conditions; but under cultivation it is found best to treat the majority of them as pot-plants, the exceptions being such as *T. bulbosa, T. Gardneri, T. ixioides,* and *T. usneoides* (Old Man's Beard)—which last could not well be grown in a pot, and, as it makes no roots, does not require soil. These should be fastened on to blocks of cork or soft wood, and a little sphagnum placed about them to root in. Grown in pots, the strongest kinds, *e.g., T. corallina, T. Itatiaiæ,* the gigantic *T. regina,* and *T. splendens,* require a strong soil, such as fibrous loam with rotted manure added, or loam, peat, and manure. *T. Lindeni* and the whole of the *Vriesia*

Tillandsia—*continued.*

section thrive best in a mixture of loam, peat, and leaf mould, with a sprinkling of crushed bones added. The small, grassy-leaved kinds, of which *T. angustifolia* and *T. virginalis* are examples, may be grown in peat and sphagnum. All the species delight in abundant sunlight, a high temperature during summer, plenty of water (though the soil must not be kept saturated), and syringing overhead twice a day. In winter, they should be kept from getting quite dry, but need not be syringed. Nothing can exceed the beauty of many of the Tillandsias, when in good health, and bearing their richly-coloured flowers. There is no more beautiful plant than *T. Lindeni,* whilst *T. carinata, T. Morreni, T. psittacina,* and *T. splendens,* are most richly coloured. Propagation is effected by seeds and suckers, chiefly by the latter. They should be allowed to grow large before being detached from the parent, and inserted singly in pots just large enough to hold the sucker, using a compost of loam, peat, and leaf mould. The suckers must not be confined in a close frame for propagating, but kept moderately moist and well shaded. Spring is the best season for detaching them.

With the assistance of the following "Classified List of the Cultivated Tillandsias" (for which we are indebted to Mr. J. G. Baker, who has generously lent the manuscript of his unpublished Monograph for the purpose), the names of any of the species described below may be the more readily determined.

Leaves spaced out on a long stem . . .	*Strepsia.*
Leaves crowded, rosulate, coriaceous, acuminate, densely lepidote.	
Inflorescence distichous . . .	*Diaphoranthema.* *Phytarrhiza.* *Platystachys.*
Inflorescence multifarious . . .	*Anoplophytum.* *Pityrophyllum.*
Leaves rosulate, broader and thinner, obscurely lepidote.	
Inflorescence distichous . . .	*Allardtia.* *Wallisia.* *Vriesia.*
Inflorescence multifarious . . .	*Cyathophora.* *Conostachys.*

SUB-GENUS I. STREPSIA.

Flowers solitary in the axils of the stem leaves. Stems pendulous, filiform.

usneoides.

SUB-GENUS II. DIAPHORANTHEMA.

Flowers one or few; style and stamens short. Leaves subterete. Leafy stem short.

bryoides.
recurvata.

SUB-GENUS III. PHYTARRHIZA.

Flowers spicate or panicled; petal blade broad, spreading; style and stamens short. Leaves rosulate.

crocata.
Duratii
ixioides
xiphioides

SUB-GENUS IV. PLATYSTACHYS.

Flowers spicate or panicled; petal blade lingulate; stamens and style longer than the calyx. Leaves rosulate.

anceps
angustifolia
Balbisiana
bulbosa
Caput-Medusæ
distachya
filifolia
flexuosa
glaucophylla
Karwinskiana
monadelpha
narthecioides
polystachya
pruinosa
setacea
streptophylla
tectorum
vernicosa
vestita
xiphostachys

Tillandsia—*continued.*

SUB-GENUS V. ANOPLOPHYTUM.

Flowers spicate or panicled. Leaves rosulate, narrow, acuminate.

dianthoidea
didisticha
Gardneri
geminiflora
pulchra
stricta

SUB-GENUS VI. PITYROPHYLLUM.

Flowers in a capitulum in the centre of the rosette of leaves.

brachycaulos
ionantha

SUB-GENUS VII. ALLARDTIA.

Differs from *Platystachys* only in leaf.

cyanea
Roezlii
virginalis

SUB-GENUS VIII. WALLISIA.

Differs from *Phytarrhiza* only in leaf.

Hamaleana
Lindeni
umbellata

SUB-GENUS IX. VRIESIA.

Petals white or yellow, large, with two scales on the claw. Leaves broad, usually lorate.

Spikes dense, simple.

Barilleti
Billbergiæ
carinata
chrysostachys
Duvaliana
gladioliflora
heliconioides
incurvata
splendens
viminalis
viridiflora

Spikes lax, simple.

amethystina
corallina
ensiformis
fenestralis
guttata
Jonghei
paraibica
Platzmanni
psittacina
psittacino-carinata
psittacino-scalaris
scalaris
Warmingii
Wawranea

Spikes disposed in a panicle.

gracilis
hieroglyphica
Morreni
Philippo-Coburgi
regina
reticulata
Rodigasiana
tessellata

SUB-GENUS X. CYATHOPHORA.

Differs from *Allardtia* in the inflorescence.

utriculata

SUB-GENUS XI. CONOSTACHYS.

Differs from *Vriesia* in the inflorescence.

Malzinei
Saundersii

T. acaulis (stemless). A synonym of *Cryptanthus acaulis.*

T. aloifolia (Aloe-leaved). A synonym of *T. flexuosa.*

T. amethystina (amethystine). *fl.* yellow, 2½in. long, distichous, distant, sub-sessile, tubular; petals twice the length of the sepals; anthers exserted; bracts greenish-yellow, small; spike distichous, the rachis pulvinate; scape slender, erect, exceeding the leaves, bracteate. *l.* 12in. to 16in. long, lingulate, acuminate, shining-green above, amethystine beneath. South Brazil, 1884. SYN. *Vriesia amethystina* (B. H. 1884, 15-16).

T. anceps (two-edged). *fl.* 2in. long; sepals pale yellow, keeled, imbricated; petals white and purplish, twice as long as the sepals; bracts greenish-yellow, red-margined, cymbiform, bluntly mucronate; spike oblong, solitary; scape nearly 1ft. long. June.

Tillandsia—*continued.*

l. numerous, imbricated, about 1ft. long, curved to one side, broad, sheathing, and very concave at base, becoming subulate above, dingy-green, whitish-scaly outside. West Indies and Central Mexico, 1824. SYNS. *T. setacea,* of Hooker (B. M. 3275), *T. tricolor* (B. H. 1879, 10-11), *Phytarrhiza anceps* (B. H. 1879, 20-1).

T. angustifolia (narrow-leaved). *fl.* blue; sepals half as long as the erect petals; bracts imbricate-distichous; central spike 4in., lateral ones 1½in. to 2in., long. August. *l.* linear from a subulate base, convolute, curved, about as long as, or longer than, the stem, lepidote. *h.* 1ft. to 2ft. West Indies, 1822.

T. argentea (silvery). A garden synonym of *T. Gardneri.*

T. argentea (silvery), of K. Koch. A synonym of *T. tectorum.*

T. Balbisiana (Balbis'). *fl.*, sepals exceeding half the petals, all distinct; petals violet, erect, convolute, spathulate-linear, 1½in. long; stigmas exserted; bracts green, red, and yellow, imbricate-distichous, oblong-lanceolate, acuminate, ten lines long; spike compound, compressed; lateral spikes three to eight, 2in. to 3in. long, appressed, alternate. *l.* lanceolate-linear from a subulate base, convolute, recurved, exceeded by the stem, lepidote. *h.* 1ft. to 1½ft. West Indies, 1874. (B. H. 1879, 6-7.)

T. Barilleti (Barillet-Dechamps'). *fl.* yellow; bracts yellowish-olive, very numerously spotted with dark blood-colour, distichous, clustered, conduplicate, navicular, equitant; spike simple, elongated, ancipitous; scape about as long as the leaves. *l.* green, smooth-edged, 16in. to 20in. long, shortly acuminate, with the margins rolled in at the middle. Andes of Ecuador, 1883. SYN. *Vriesia Barilleti* (B. H. 1883, 3).

T. Billbergiæ (Billbergia-like). *fl.* tricoloured (green, white, and red), sessile; corolla dilated. *l.* resembling those of *Billbergia*, quite glabrous, rosulate, imbricate, dilated, amplexicaul at the base, very thin, slightly recurved, oblong-ligulate, oblique, and very shortly and abruptly apiculate, sub-coriaceous, pale green, furfuraceous at the base outside. *h.* 10in. Mexico.

T. brachycaulos (short-stemmed). *fl.* purple, about twelve in a head, which is sessile amongst the leaves. *l.* linear, channelled, recurved, 6in. to 9in. long, red on the upper surface, greyish-green beneath, slightly scurfy. Central Mexico, 1878. A handsome, dwarf species. (B. H. 1878, 11.)

T. brachystachys (short-spiked). A synonym of *T. carinata.*

T. bryoides (Moss-like). *fl.* three or four in a small, distichous spike; style and stamens short; scape capillary, 2in. long. *l.* small, lanceolate-subulate. Stems slender, branched. South Brazil, &c., 1880. A small, Moss-like plant. SYN. *S. polytrichoides.*

T. bulbosa (bulbous). *fl.*, sepals distinct; petals violet, white at the point, 1½in. long, recurved at the summit, convolute spathulate-linear; bracts eight to nine lines long, imbricate-distichous; spikes five to eight, sub-equal, approximate, spreading, 2in. to 3in. long. November. *l.* convolute-filiform, greenish, minutely lepidote; rosulate ones dilated into the roundish sheaths of the bulbous stem-base, flexuous; uppermost ones exceeding the spikes. *h.* 8in. to 12in. West Indies, Buenos Ayres, &c., 1823. (H. E. F. 173.) SYN. *T. paucifolia. T. eminens, T. erythræa, T. inanis,* and *T. pumila,* are mere varieties of this species.

T. Caput-Medusæ (Medusa's Head). *fl.* six or seven to a spike; bracts green; spikes about four, forming a compound panicle; scape shorter than the leaves, clothed with elongated bracts. *l.* tumid at base, forming a kind of bulb, lanceolate, thick, channelled, divaricate, arched, undulated, unequal, shining, silky-grey. Mexico, 1880.

T. carinata (keeled).* *fl.* projecting ½in. beyond the bracts; sepals pale yellow, keeled; petals pale yellow, twice as long as the sepals, cohering nearly to the dark green tips; bracts green beyond the middle, scarlet below, 2in. long, closely imbricated, laterally much compressed; spike 5in. long, broadly ovate, the rachis scarlet; scape scarlet, 6in. long, stout, cylindric, the sheaths green-tipped. November. *l.* 4in. to 6in. long, 1in. to 1½in. broad, spreading and recurved, pale green, broadly strap-shaped from a dilated, sheathing base. South Brazil, 1866. A very brilliant plant. SYNS. *T. brachystachys, Vriesia brachystachys* (B. M. 6014; R. G. 1866, 518), *V. psittacina brachystachys* (B. H. 1870, 8), *V. p. carinata* (B. H. 1882, 10-12).

T. chrysostachys (golden-spiked). *fl.* yellow, regular; sepals free, lanceolate; petals longer, ligulate, obtuse; bracts yellow, conduplicate; spike simple, distichous, elliptic, elongated; scape elongated, erect, bracteate. *l.* numerous, rosulate, lax, arched, coriaceous, short and broad, loriform, lingulate at base, of a pleasing green, but rosy and glaucescent beneath towards the base. Stem short. Andes of Peru, 1881. (B. M. 6906.)

T. circinalis (crozier-like). A synonym of *T. Duratii.*

T. circinata (crozier-like). A synonym of *T. streptophylla.*

T. complanata (complanate). A synonym of *T. xiphostachys.*

T. corallina (coral-red).* *fl.* green, distant, refracted, each subtended by a long, purplish-crimson bract, the scape and rachis being of the same brilliant colour; petals large, with two scales on the claw; spikes distichous. *l.* oblong-ligulate, blunt and apiculate, green. Minas Geraes, 1871. SYNS. *Encholirion corallinum* (F. M. n. s. 116), *Vriesia corallina* (R. G. 1870, 671).

Tillandsia—*continued.*

T. c. rosea (rosy). This differs from the type in its rose-tinted flowers. SYN. *Encholirion roseum.*

T. cordobensis (Cordoba). A synonym of *T. recurvata.*

T. crocata (saffron-yellow). *fl.* of a saffron-yellow colour, about five in a short, elliptic, distichous spike; scape elongated, slender, villous, nearly naked. *l.* distichous, long, linear-subulate, recurved, covered with silky, white hairs. Stem undulated, branched. South Brazil, 1880. SYN. *Phytarrhiza crocata.*

T. cyanea (blue). *fl.* blue, in a branching panicle from the centre of a rosette of strap-shaped, entire leaves. *h.* 2½ft., when in flower. Guatemala, 1852. SYNS. *Allardtia cyanea, Platystachys cyanea.*

T. dianthoidea (Dianthus-like). *fl.*, corolla tubular, the tube cylindrical, the limb blue, spreading or reflexed; bracts purplish-rose, ovate-lanceolate, acute, persistent; spike loose, six to ten-flowered. *l.* amplexicaul, the outer ones recurved, the inner ones erect or inflexed, coriaceous, rigid, triquetrous towards the apex, acute, entire, silky-glaucous. Stem nearly terete, simple, ascending, 3in. to 5in. long. Uruguay, &c., 1810. (R. G. 85.) SYN. *T. stricta*, of Lindley (B. R. 1338).

T. d. rosea (rosy). *fl.* white, issuing from rosy-pink bracts; scape short. *l.* glaucous, lanceolate-subulate, recurved, channelled. 1861. SYNS. *T. recurvifolia* (B. M. 5246), *T. rosea* (B. R. 1357).

T. didisticha (twice-two-rowed). *fl.* white; spikes elliptic, forming a crowded, distichous panicle; scape elongated, arched, clothed with bracts. *l.* thick and robust, disposed in a rosette, lanceolate, channelled, acuminate, cinereous. South Brazil, 1881. SYN. *Anoplophytum didistichum.*

T. distachya (two-spiked). *fl.*, sepals ¾in. long, free to the base; corolla white, more than twice as long as the calyx, the petals oblanceolate, with a long claw; bracts green, oblong-lanceolate, about 1in. long; spikes two, distichous, six to twelve-flowered; scape erect, 6in. long, hidden by its linear, falcate leaves. *l.* twelve to fifteen in a sessile rosette, lanceolate, acuminate, about 1ft. long, the dilated base 1in., the middle of the lamina ½in., broad, the face pale green, concave, glabrous upwards, thinly lepidote towards the base, the convex back thinly lepidote throughout. *h.* 1ft. British Honduras, 1879.

FIG. 37. TILLANDSIA DURATII, showing Habit and detached Inflorescence.

T. Duratii (Durati's). *fl.* violet; panicle compact, 3in. to 4in. long, composed of several dense, few-flowered spikes; scape 6in. high. *l.* twelve to twenty, spreading, 6in. to 9in. long, gradually tapering to a thick, subulate, channelled, more or less circinate tip, everywhere densely silvery-lepidote. Uruguay, 1879. See Fig. 37. SYNS. *T. circinalis, T. revoluta, Wallisia Duratii.*

Tillandsia—*continued.*

T. Duvaliana (Duval's). *fl.* yellow, green at apex; bracts scarlet below, green above, conduplicate, keeled, beaked, equitant; spike simple, elongated-elliptic, about eighteen-flowered; scape erect, about 1ft. high. *l.* membranous, short, lanceolate, green above, tinged with red beneath, the sheath broad. South Brazil, 1884. SYN. *Vriesia Duvaliana* (B. H. 1884, 7-8).

T. eminens (eminent). A form of *T. bulbosa.*

T. ensiformis (sword-shaped). *fl.* of a reddish-yellow colour. June. *l.* tongue-shaped, yellow-green, about 1ft. long, the edges entire. *h.* 1½ft. Brazil.

T. erubescens (blushing). A garden synonym of *T. ionantha.*

T. erythræa (red). A form of *T. bulbosa.*

T. fenestralis (fenestrate). *fl.*, sepals long, elliptic, convolute in a tube; petals pale yellow, longer, very broad; spike distichous, elongated; scape erect, long, robust. *l.* coriaceous, about 12in. long, broad, arched, concave, pale, beautifully marked with pellucid reticulations in the upper half, rounded-mucronate at apex, slightly spotted with red at base. Parana, 1875. Plant tufted. (B. M. 6898.) SYN. *Vriesia fenestralis* (B. H. 1884, 4-5; I. H. n. s. 215).

T. filifolia (thread-leaved). *fl.* pale blue, small, distichous, with reflexed petals; inflorescence paniculate, not unlike that of some of the species of *Statice*, with lax, drooping branches. *l.* subulate, filiform, spreading. Mexico, Vera Cruz, &c., 1871. A very elegant, dwarf, densely-tufted plant. SYN. *T. staticiflora* (B. H. 1871, 12).

T. flexuosa (flexuous). *fl.* rosy, distant; sepals 1in. long; petals 2in. long, linear, spreading at the summit; bracts rosy, distichous, spreading, oblong-lanceolate, bluntish; spike with a few long, spreading branches, or simple. *l.* linear, acuminate, subulate at base, recurved, shorter than the stem, lepidote with minute scales or greenish, transversely zonate beneath. *h.* 1½ft. to 3ft. West Indies, &c., 1790. (B. R. 749.) SYNS. *T. aloifolia* (H. E. F. 205), *T. tenuifolia* (of Jacquin).

T. Gardneri (Gardner's). *fl.*, sepals glabrous; petals pale purplish, small; spikes four to eight, short, distichous, crowded; bracts lepidote; scape 2in. to 4in. high, densely sheathed with linear-subulate, lepidote leaves. *l.* 6in. to 8in. long, flat in the lower part, narrowed from a ½in.-broad base to a reflexing, subulate, convolute point, everywhere densely covered with silvery scales. South Brazil, &c., 1879. SYNS. *T. argentea* (of gardens), *Anoplophytum incanum* (B. H. 1881, 11).

T. geminiflora (twin-flowered). *fl.* madder-coloured; sepals shorter than the petals, the limb of which is reflexed; filaments sigmoid towards the apex; bracts red, lanceolate, mucronate, rather longer than the sepals; spike oblong, sub-compound; scape erect, clothed with red, green-tipped, acuminate sheaths. February. *l.* ovate-lanceolate, channelled, acuminate, the outer ones spreading-recurved. South Brazil, &c., 1840. SYNS. *T. rubida* (B. R. 1842, 63), *Anoplophytum geminiflorum* (B. H. 1880, 11).

T. gigantea (gigantic). A form of *T. regina.*

T. gladioliflora (Gladiolus-flowered). *fl.* greenish-violet; spike simple; bracts green, closely imbricated. *l.* broadly ligulate, abruptly acuminate, glabrous. Costa Rica, 1863.

T. glaucophylla (glaucous-leaved).* *fl.*, sepals greenish-white; petals purple, almost white at apex, convolute, erect; filaments banded with purple; lower bracts red, the rest green tinged with yellow and red; spikes four or five, 9in. long; scape red, 1ft. or more long. August. *l.* imbricated round a rather tumid base, spreading, recurved, 1ft. to 1½ft. long, gradually tapering from a broad and rather concave base to a slender point, sub-farinose or flocculose. Santa Marta, 1847. SYN. *Vriesia glaucophylla* (B. M. 4415; F. d. S. 432).

T. gracilis (slender). *fl.* remote, sessile, distichous; petals oblong, slightly dilated and scarcely spreading at apex; bracts reddish at base, greenish towards the apex; panicle loose, erect, the branches erecto-patent, five to eight-flowered, 6in. to 8in. long; scape 2ft. to 2½ft. high. *l.* entire, of a pleasing green, 10in. to 12in. long, broad and semi-amplexicaul at base, attenuated towards the acute apex. Forests of Southern Brazil, 1886. SYN. *Vriesia gracilis* (R. G. 1886, p. 163).

T. guttata (spotted). *fl.* numerous, distichous, approximate; sepals citron-coloured, with reddish marks, elliptic; petals yellow, obovate-ligulate; bracts light rose-coloured, broad, conduplicate, nearly equalling the calyx, farinose; spike simple, very long, pendulous; scape arched. *l.* short, slightly acute, mucronate, olivaceous, richly spotted and blotched with dark purple. South Brazil, 1875. SYN. *Vriesia guttata* (B. H. 1880, 1-3; I. H. n. s. 200).

T. Hamaleana (Hamale's).* *fl.* sessile, bifarious, fragrant; sepals green, ovate-lanceolate; claw of petals white, linear, channelled, the limb beautiful violet, snow-white at base, rhomboid-dilated, spreading-reflexed, obcordate; bracts green and purplish, lepidote, conduplicate; spike compound, the branches distichous; spike erect, longer than the leaves, with remote, reddish bracts. *l.* approximate, divaricate, the lower ones arcuate-deflexed, the upper ones erect, linear, concave, uncinate-revolute at apex, unarmed, not lepidote. Andes of Peru, 1870. (B. H. 1870, 5.) SYNS. *Phytarrhiza Hamaleana, Wallisia Hamaleana.*

Tillandsia—*continued.*

T. heliconioides (Heliconia-like). *fl.* sessile, distant; sepals whitish, striated, lanceolate, acuminate, concave; corolla white, tripartite, the segments lanceolate-linear; bracts striated, ovate, acute, keeled, spreading, 1in. or more long; spike 4in. to 6in. long. *l.* linear-lanceolate, subulate at apex, nearly flat, glabrous, coriaceous, striated, recurved, 1½ft. long. Stem simple, scarcely 1ft. long, leafy. Rio Magdalena Valley. SYNS. *Vriesia bellula* and *V. Falkenbergii* (of gardens), *V. heliconioides* (G. C. n. s., xxi., p. 140; I. H. n. s. 490).

T. hieroglyphica (hieroglyphic). *fl.* disposed in a lax panicle; bracts ovate, conduplicate, short; panicle branches spreading, short, naked at base, bearing seven or eight pedicellate flowers. *l.* forming a tuft 3ft. to 7ft. in diameter, long, loriform, broad, especially at base, glabrous, mucronate, obtuse, green, very handsomely marked above with dark green, and below with blackish-purple. South Brazil. An exceedingly handsome foliage plant. SYNS. *Massangea hieroglyphica* (R. H. 1878, p. 175), *Vriesia hieroglyphica* (B. H. 1885, 10-12; I. H. 1884, 514). For some time after it was introduced, the flowers of this species were unknown. In 1885, however, it flowered in the Brussels botanical garden, and was then found not to be a Massangea at all; therefore, this species should not be referred to *Caraguata*, as mentioned under *Massangea*.

T. inanis (uninteresting). A form of *T. bulbosa*.

T. incurvata (incurved). *fl.* yellow, tipped with green, sub-sessile, long-tubular; petals ligulate, the limb obtuse, recurved; bracts beautiful orange and red, conduplicate, keeled, oval-lanceolate; spike dense, stout, distichous. *l.* green, lorate, shortly acuminate, widened at base. South Brazil, 1882. SYNS. *T. inflata* (B. M. 6882), *Vriesia incurvata* (B. H. 1882, 2).

T. inflata (inflated). A synonym of *T. incurvata*.

T. ionantha (violet-flowered).* *fl.* sessile, crowded at the tips of the branches; petals pale violet, convolute by their linear, broad claws; bracts lanceolate, equalling the sepals. *l.* numerous, closely imbricated, 2in. to 2½in. long, recurved, subulate-lanceolate, very coriaceous, concave above, sub-pungent at tip, the margins ciliated; upper ones more erect, bright rose-coloured, at length wholly green. *h.* 3in. to 4in. Brazil (?), 1871. Plant tufted. (B. M. 5892; F. d. S. 1006.) SYNS. *T. erubescens* (of gardens), *Pitrophyllum ionantha*.

T. ixioides (Ixia-like). *fl.* three to five in a spike, sub-tristichous; sepals equalling the claw of the petals; petals orange; limb only half as long as the claw; anthers included. *l.* imbricated, linear, acuminate, slightly dilated at the base, with silvery scales on the dorsal nerve. *h.* 6in. Uruguay.

T. Jonghei (Jonghe's). *fl.* tawny-yellow, rather remote, horizontal; sepals greenish, with fuscous margins, ovate, convex, bidentate at apex; corolla campanulate, the petals obtuse, emarginate; bracts fuscous-green, conduplicate, plicate, gibbous at base, shorter than the sepals; spike simple, ancipitous, the rachis distichous-pulvinate; scape erect, simple, longer than the leaves, with lanceolate, leafy bracts. *l.* lorate, recurved, fuscous-purplish beneath. Minas Geraes, 1874. (B. H. 1874, 12-13.) SYN. *Vriesia Jonghei*.

T. juncifolia (Rush-leaved). A synonym of *T. setacea*.

T. Karwinskiana (Karwinsky's). *fl.* one to twelve arranged in a single lax, narrow, distichous spike; sepals glossy-green, glabrous; petals violet; scape 9in. to 12in. long. Winter. *l.* twenty to thirty in a dense rosette, 1ft. long, narrowed from a base 1in. broad to a long point, pale green, lepidote on the back, nearly or quite naked on the face. Mexico, 1878.

T. Lindeni (Linden's).* *fl.* axillary, sessile; sepals green, reddish at apex, lanceolate, acuminate, channelled; petals spathulate, the claw linear, the limb of a beautiful bluish-purple, spreading, ovate, sub-acuminate; stamens included; bracts very densely distichous-imbricate, cymbiform, keeled, entire, truncate at apex, smooth, the included base greenish, the outer part of a beautiful carmine; spike terminal, simple, ovate, compressed, rather shorter than the leaves, about twenty-flowered. *l.* rosulate, 8in. to 12in. long, ½in. to ¾in. broad, spreading-recurved, attenuated, acuminate, entire. Andes of Peru, 1867. A handsome species. (B. H. 1869, 18; F. M. 1872, 44; I. H. 1869, 610.) SYNS. *T. Morreniana*, *Phytarrhiza Lindeni*.

T. L. intermedia (intermediate). *fl.*, bracts green, slightly shaded with rose-colour; scape longer than in the type. 1871. An intermediate form between the type and *T. L. Regeliana*. (F. M. 1871, 529.)

T. L. luxurians (luxuriant). *fl.*, scapes many, axillary, elongated. 1871. (B. H. 1871, 20-21.)

T. L. major (greater).* *fl.* bright azure-blue, with a white centre, much larger than in the type. 1871. (F. M. n. s. 529.)

T. L. Regeliana (Regel's). *fl.*, bracts green; spike narrower than in the species; scape elongated. 1877. (G. C. n. s., xii., p. 461.) SYN. *T. Lindeniana* (R. G. 1869, 619).

T. Lindeniana (Linden's). A synonym of *T. Lindeni Regeliana*.

T. Malzinei (Omer de Malzine's). *fl.* twelve to twenty in a dense, simple, multifarious spike; petals white, lingulate, twice as long as the calyx, with a pair of white, fimbriated scales at the base; bracts yellow or red, ovate-navicular, above 1in. long. April. *l.* fifteen to twenty in a dense rosette, about 1ft. long, 3in. broad at the dilated base, falcate, chartaceous, deltoid-cuspidate at apex, bright green on the face, red-brown with fine vertical lines at back. Mexico, 1874. Acaulescent. (B. M. 6495.) SYN. *Vriesia Malzinei* (B. H. 1874, 14).

T. monadelpha (monadelphous). *fl.* about twenty, whitish, tinged with light purple, rather remote, sub-sessile; petals spathulate, the limb spreading; stamens monadelphous at base; bracts conduplicate, green, tinged with yellow, shining; spike simple, loose, the rachis distinctly pulvinate, green; scape erect, longer than the leaves. *l.* numerous, broad and green at the base, above arcuate, lanceolate, acute, purple on both sides. Guiana, 1882. SYN. *Phytarrhiza monadelpha* (B. H. 1882, 7).

T. Morreni (Morren's).* *fl.* secund, one sessile in the axil of each viscid, brown bracteole; calyx light brown, about twice the length of its bracteole; petals yellowish-green, very narrow; panicle pyramidal; bracts straw-coloured. *l.* two, 2½in. broad, erect, 1½ft. long, sub-coriaceous, with broken, zigzag, transverse markings; tip rounded, minutely mucronate. *h.* 15in. Brazil.

T. Morreniana (Morren's). A synonym of *T. Lindeni*.

T. muscosa (mossy). A garden synonym of *Pitcairnia muscosa*.

T. narthecioides (Narthecium-like). *fl.* yellowish-white, inconspicuous, distant, nearly horizontally spreading; bracts glabrous, as long as the calyx, oblong, striated; spike 4in. long, erect, simple; scape 6in. high, erect. *l.* linear, flat, 8in. long, ¼in. broad, subulate at apex, dilated at base. Guayaquil, 1878.

T. nitida (shining). A synonym of *Catopsis nitida*.

T. paraibica (Parahiba). *fl.* in a densely-imbricated, distichous spike; bracts large, purple-red, as long as the golden-yellow calyx; petals yellow, much longer than sepals. Summer. *l.* green, shining, lingulate, 6in. to 9in. long, about 1in. wide, about as long as the scape. *h.* 6in. to 9in. Brazil, 1885.

T. paucifolia (few-leaved). A synonym of *T. bulbosa*.

T. Philippo-Coburgi (Prince Philip of Saxe-Coburg's). *fl.* distant, secund; calyx golden-yellow; petals greenish, protruding at the summit of the calyx a third longer, the included part folded into a very narrow tube; panicle pyramidal, the branches red; lower bracts large, dark red; bracteoles bright red, scarious, clasping at the base, oblong-lanceolate, very acute. *l.* 2½in. broad, rigidly membranous, light green, shining, the apex reddish-brown; sheath slightly dilated, variegated with pale purplish blotches. *h.* 15in. Brazil. SYN. *Vriesia Philippo-Coburgi*.

T. picta (painted). A garden synonym of *T. splendens*.

T. Platzmanni (Platzmann's). *fl.* yellow, distichous, rather remote, shortly pedunculate, tubular; sepals fuscous at base, convolute in a tube; petals also convolute; bracts purplish, navicular; spike simple, secund, about ten-flowered; scape 3ft. to 4ft. high, slender, erect, bracteate. *l.* lingulate, broad at base, green, margined with red. South Brazil, 1875. SYN. *Vriesia Platzmanni* (B. H. 1875, 23).

T. polystachya (many-spiked). *fl.* sessile; calyx bipartite; petals blue, rarely white, linear, channelled-concave, acuminate; bracts scarlet, imbricated above; spikes numerous, the lateral ones about ten, 1ft. long, alternate. June. *l.* linear-subulate, acuminate, entire, channelled, broad and ventricose at base, the lower ones 2ft. long. Stem leafy, erect, 3ft. high. West Indies, &c., 1825.

T. polytrichoides (Polytrichum-like). A synonym of *T. bryoides*.

T. pruinosa (pruinose). *fl.*, sepals seven to eight lines long, all distinct; petals blue, fourteen to sixteen lines long, convolute, spreading at the summit, spathulate above the claw; bracts rose-coloured, 1in. long, distichous, approximate, ovate-oblong, pointed; spike simple, 2in. to 3in. long. *l.* convolute-filiform from a subulate base, recurved, as long as the stem. *h.* 4in. to 6in. West Indies, Brazil, &c. Plant wholly covered with spreading, white scales. (B. H. 1876, 16-17.)

T. psittacina (parrot-like).* *fl.* large, remote, distichous; petals green at the point, rather longer than the bracts, which are bright red in the lower part, and deep yellow above; rachis red; scape 1ft. or more high. July. *l.* radical, 6in. to 8in. long, linear-ligulate, much inflated, recurved, acute, entire, yellow-green, thin, more or less waved. Forests near Rio Janeiro, 1828. (B. M. 2841.) SYN. *Vriesia psittacina* (B. H. 1882, 10-12; B. R. xxix. 10). Morren unites with this *T. carinata* as a variety.

T. psittacino-carinata (hybrid). A good and handsome garden hybrid, having more numerous and approximate flowers than *T. psittacina*. 1883. SYN. *Vriesia Morreniana* (B. H. 1882, 10-12, f. 2.)

T. psittacino-scalaris (hybrid). *fl.* as in *T. psittacina*, ten to fifteen on a reflexed rachis; internodes short; scape arcuate, dependent. 1885. Habit stouter than *T. scalaris*. SYN. *Vriesia retroflexa* (B. H. 1884, 10.)

T. pulchella (pretty). A synonym of *T. pulchra*.

T. pulchra (beautiful).* *fl.*, calyx greenish-white; petals quite white; bracts of a beautiful, delicate red, imbricated and sheathing, almost entirely concealing the flowers; scape, including the spike, about as long as the leaves. *l.* 4in. to 6in. long, quite subulate, hoary with a minute, scurfy pubescence, channelled,

Tillandsia—*continued.*

especially towards the base. South Brazil, &c., 1840. Plant tufted. SYNS. *T. pulchella* (B. H. ix. 322; B. M. 5229), *Pourretia surinamensis* (of gardens).

T. p. amœna (pleasing). *fl.*, sepals pink; petals much longer, with a white claw and a lilac limb; spike few-flowered; scape erect, sheathed by pink bracts. *l.* narrow-subulate. Stem branched flexuous. SYN. *Anoplophytum amœnum* (B. H. 1883, 17).

T. pumila (dwarf). A form of *T. bulbosa.*

T. recurvata (recurved). *fl.*, sepals about three-fourths as long as the blue corolla; petals naked within, spreading above the calyx; peduncles axillary or terminal, sub-solitary, exserted, two to five-flowered; spike included by a sheathing bract, each flower by a smaller bract, the upper ones somewhat distant. *l.* 2in. to 3in. long, filiform, recurved. Stems tufted. Scaly down spreading. *h.* about 6in. Tropical America, 1793. SYN. *T. cordobensis.*

T. recurvifolia (recurved-leaved). A synonym of *T. dianthoidea rosea.*

FIG. 38. TILLANDSIA REGINA.

T. regina (queen).* *fl.* white, exhaling a strong, Jasmine-like perfume; bracts rose-coloured; spikes two-ranked, curved, disposed in a branched panicle; scape developing very rapidly, eventually attaining a height of about 7ft. *l.* about 4ft. long, recurved at apex, broadly sheathing at base. South Brazil, 1867. A magnificent plant. See Fig. 38. SYNS. *Vriesia gigantea, V. Glaziovana, V. regina* (G. C. n. s., iii., p. 235). *T. gigantea* is merely a form of this species.

T. reticulata (netted-leaved). *fl.* in a paniculate inflorescence, 1ft. or more long; calyx greenish, 1½in. long; petals milk-white, ½in. longer than the calyx; stamens longer than petals. Spring. *l.* lorate-lanceolate, 1½in. to 2ft. long, in a dense rosette, 3in. above the dilated base, moderately firm in texture, nearly naked on both sides, copiously reticulated with fine transverse lines of dark green on a pale green ground. *h.* 1½ft. to 2ft. Rio Grande do Sul, 1870. SYNS. *Guzmannia reticulata, Vriesia reticulata.*

T. revoluta (revolute). A synonym of *T. Duratii.*

Tillandsia—*continued.*

T. Rodigasiana (Rodigas'). *fl.* citron-yellow, distichous, remote, sub-sessile, spreading, tubular; sepals obtuse; petals thrice as long as the sepals, ligulate, the limb arcuate; bracts tinged with red, striated, ovate, short; panicle loose, elongated, elliptic, the branches spreading, few-flowered, nearly sessile, springing from a short, scarlet spathe; scape elongated, erect, slender, with narrow bracts. *l.* short, arcuate-spreading, broadly sheathing and fuscous at base, the blade loriform, slightly channelled, rounded-cuspidate, green, with a few dark blood-coloured markings. South Brazil. Closely allied to *T. gracilis.* SYN. *Vriesia Rodigasiana* (I. H. n. s. 467.)

T. Roezlii (Roezl's). *fl.* rosy; spikes distichous, ancipitous, elliptic, forming a tall panicle. *l.* large, linear, acute, dark green, with large, black blotches on the upper part, the margins incurved. Andes of Northern Peru, 1877. A plant of bold habit. (B. H. 1877, 15.)

T. rosea (rosy). A synonym of *T. dianthoidea rosea.*

T. rubida (reddish). A synonym of *T. geminiflora.*

T. sanguinolenta (blood-red). *l.* deflexed at the apex, with numerous irregular blotches of dark blood-red on both surfaces. *h.* 9in. to 12in. New Granada, 1875. As the flowers of this species are unknown, it has been impossible to place it in the key, or even to state with certainty whether it is really a Tillandsia or no. SYN. *Encholirion sanguinolenta* (I. H. 1875, 200).

T. Saundersii (Saunders').* *fl.* sulphur-yellow; sepals equitant, oblong, concave; panicle loose, the primary raceme few-flowered, divaricate, bracteate; scape erect, shining, angled, yellowish-white. *l.* rosulate, short, deeply and broadly sheathing at base, linear, obtuse, decurved, coriaceous, above greyish-green, slightly dotted with white, below striated and spotted with blood-colour. *h.* 1½ft. Brazil, 1872. SYN. *Encholirion Saundersii* (I. H. n. s. 132).

T. scalaris (ladder-like). *fl.* very long and pretty; calyx yellow; corolla green; bracts of a deep rose-colour; scape 1½ft. to 2ft. long, hanging from the plant like a rope ladder. *l.* ligulate, about 10in. long, green, ciliated. South Brazil, 1879. SYN. *Vriesia scalaris.*

T. setacea (bristly). *fl.*, sepals half as long as the corolla; petals bluish-purple, spathulate, 1in. long, spreading at the summit; bracts lepidote, imbricate-distichous, ovate-oblong, pointed, as long as the sepals; spike 2in. to 3in. long, compressed, simple, or with a few short, appressed branches at the base. *l.* convolute-filiform, little or gradually dilated at base, sub-erect, equalling or exceeding the scape. *h.* 8in. to 18in. West Indies to Brazil, 1825. (Ref. B. 288.) SYNS. *T. juncifolia* (R. G. 811), *T. tenuifolia* (of Linnæus), in part (B. H. 1876, 14).

T. setacea (bristly), of Hooker. A synonym of *T. anceps.*

T. speciosa (showy). A garden synonym of *T. splendens.*

T. splendens (splendid).* *fl.*, calyx free, the sepals oblong-lanceolate; petals yellow, free, linear or linear-oblong, slightly dilated-spathulate at apex, thrice the length of the calyx; bracts fiery-purple, lanceolate, acute, keeled, oblique, closely imbricated; spike simple, distichous, compressed, ancipitous, linear-lanceolate, longer than the scape; scape erect, simple, longer than the leaves, the closely-appressed scales green, fuscous-spotted. *l.* eight to twelve, linear-oblong, concave at base, nearly 2ft. long, 3in. broad, flat and abruptly narrowed towards the recurved apex, of a pleasing green above, lighter beneath, with transverse, dark fuscous zones. French Guiana. See Fig. 39. (F. d. S. May, 1846, 4.) SYNS *T. picta, T. speciosa,* and *T. zebrina* (of gardens), *Vriesia splendens.*

T. staticiflora (Statice-flowered). A synonym of *T. filifolia.*

T. streptophylla (twisted-leaved). *fl.*, calyx ½in. long, hidden; corolla bright lilac, cylindrical, 1½in. long; bracts densely lepidote, much imbricated; spikes four to eight in a short panicle; peduncle short, hidden by its numerous red-tinted, lepidote, imbricated, bract-like leaves. *l.* in a dense, basal rosette, the erect, dilated base 3in. long and broad; blade 6in. to 9in. long, 1in. broad at base, gradually tapering to a long point, much twisted spirally from low down, densely lepidote. Jamaica, &c., 1878. (B. M. 6757.) SYN. *T. circinata.*

T. stricta (erect). *fl.* narrow-cylindrical, about ¾in. long; calyx pale reddish-brown; corolla deep violet-blue above the calyx, finally deep red; bracts white, red-tinged, slightly pellucid; scape about 7in. high. November. *l.* springing from a short, fleshy rootstock, about 6in. long, nearly ½in. broad at the base,

Tillandsia—*continued.*

coated with hoary pubescence. Brazil, &c., 1810. (B. M. 1529.) SYN. *Anoplophytum strictum* (B. H. 1878, 13).

T. s. caulescens (caulescent). This only differs from the type in its stem being decidedly developed, and, consequently, in the greater stature of the plant.

T. stricta (erect), of Lindley. A synonym of *T. dianthoidea.*

T. tectorum (growing on roofs). *fl.*, sepals free, lanceolate, conduplicate; petals white, blue in the middle, convolute in a tube which broadens towards the apex; bracts light green, tinged with rose, lanceolate, conduplicate, rather shorter than the sepals; spikes distichous, ancipitous, short, forming a short, contracted panicle; scape erect, tall, its bracts rosy at base. *l.* very numerous, imbricated, lanceolate-linear, spreading, arched, scarious-pilose; sheath very broad, gradually attenuated into the limb. Stem elongated, ascending, leafy. Andes of Peru, 1865. (B. H. 1877, 18.) SYNS. *T. argentea* (of K. Koch), *Pourretia nivosa* (of gardens).

T. tenuifolia (slender-leaved), of Jacquin. A synonym of *T. flexuosa.*

T. tenuifolia (slender-leaved), of Linnæus. A synonym of *T. setacea.*

FIG. 39. TILLANDSIA SPLENDENS.

T. tessellata (tessellated). *fl.*, sepals green, glutinous; petals yellow, forming a campanulate corolla; bracts green; panicle tall, erect, loose, the branches erect, arcuate, each bearing nine to twelve sub-sessile flowers; scape equalling the leaves, furnished with navicular bracts. *l.* coriaceous, rigid, channelled, tessellated in green and yellow, sub-glaucescent, acuminate at apex, the sheath broad, dark fuscous. South Brazil, 1882. SYN. *Vriesia tessellata* (B. H. 1882, 14-16).

T. tricolor (three-coloured). A synonym of *T. anceps.*

T. umbellata (umbellate).* *fl.* sapphire-blue, white in the centre, five or six opening simultaneously; calyx green; bracts light green, as large as the sepals; inflorescence a very short, ancipitous spike. Winter. *l.* 9in. to 12in. long, ½in. broad, light green, shortly sheathing at the base, ascending, spreading, filiform, acute at the tips, smooth and glossy. *h.* 1ft. Ecuador, 1882. (R. H. 1886, p. 60.) A near ally of *T. Lindeni.*

T. usneoides (Usnea-like). Long Moss; Old Man's Beard; Spanish Moss, of the West Indies. *fl.* green, solitary, terminal, about ⅓in. long; sepals tinged with red. July. *l.* alternate, bifarious, uniform throughout, spreading, 1in. to 3in. long, filiform, grooved above; sheaths ½in. to 2in. long, cylindric. Tropical America, 1877. Plant forming loose, pendulous tufts, sometimes many feet long, clothed everywhere with a spreading, silvery scurf. (B. H. 1877, 17; B. M. 6309.)

T. utriculata (bladder-like). *fl.*, sepals green, reddish-margined, half as long as the corolla; petals greenish-white, spreading at the summit; bracts green, reddish-margined, distichous, erect, oblong, blunt, longer than the internodes; spike compound, the branches long and distant. *l.* linear, acuminate, gradually tapering from an ovate base, spreading, recurved at the top, shorter than the stem. West Indies, &c., 1793

T. vernicosa (polished). *fl.* white; spikes panicled; distichous; peduncle under 6in. long. *l.* few, ensiform, polished. Parana, 1887.

T. vestita (clothed). *fl.* yellow, forming a long, cylindrical tube, exserted about 1in. from the red calyx; spike simple, few-flowered. May. *l.* linear-subulate. *h.* 6in. Mexico, 1886.

T. viminalis (twiggy). *fl.* white, 1½in. long, ½in. in diameter; petals oblong, obtuse, forming a campanulate corolla; bracts green; spike simple, distichous, dense, fusiform; scape twiggy, 2ft. high, covered with scarious bracts. *l.* in a large, open rosette, membranous, shining, ligulate, acute, recurved, entire, 1ft. long, 1½in. to 2in. broad. Costa Rica, 1878. SYNS. *T. viridiflora* (of gardens), *Vriesia viminalis* (B. H. 1878, 14-15).

T. virginalis (fragile).* *fl.* sessile; sepals green, included; corolla claviform, ample, the petals white, obovate; bracts green, conduplicate, ample, farinaceous; spike simple, distichous, elliptic, ancipitous. *l.*, primordial ones filiform; the rest lorate, with a broad sheath, pale green, farinaceous. Mexico, 1873.

T. viridiflora (green-flowered). *fl.*, petals green, fugacious; spike simple, dense, 12in. long; bracts 2in. to 2½in. long; peduncle 1½ft. to 2ft. long. Summer. *l.* twelve or more, about 1ft. long, lorate. Mexico, 1887.

T. viridiflora (green-flowered), of gardens. A synonym of *T. viminalis.*

T. Warmingii (Warming's). *fl.* yellow, rather distant, numerous, distichous, erecto-patent, tubular; petals ligulate, revolute at apex; bracts golden-yellow, tipped with green, coriaceous, ovate, closely covering the flowers; spike long, simple, the rachis rigid; scape 3ft. to 4ft. high. *l.* coriaceous, about 3ft. long and 2in. broad, slightly spreading, green, marbled and tinged with dark rose-colour, especially in the lower part, the sheath broad. South Brazil, 1884. SYN. *Vriesia Warmingii* (B. H. 1884, 12-13).

T. Wawranea (Wawra's). *fl.* ten to twelve, arranged distichously at the summit of a scape, which is clothed with green, adpressed bracts, and is somewhat shorter than the leaves; calyx green; petals waxy-yellow, pointed, recurved; filaments and pistil shorter than the petals. Summer. *l.* 18in. long, 2½in. to 3in. wide, glaucous, bluish-green, with fine, transverse, wavy lines, a dark brown blotch just under the mucro, and dark chestnut-brown at the base; rosette with about a score leaves. *h.* 1½ft.

T. xiphioides (Xiphion-like).* *fl.* snow-white, numerous; sepals linear-lanceolate, acuminate; petals with a slender, linear claw, 1in. long, and a broadly obovate, acuminate, reflexed, crisped blade; bracts 2in. long, closely imbricated; spike 3in. to 4in. long, reflexed, distichous; scape long or short. May. *l.* crowded, rosulate, 4in. to 6in. long, ½in. broad at base, broadly subulate, with recurved margins that are involute at the tip. Argentine Republic and Uruguay, 1810. Plant covered with silvery-grey tomentum, deliciously scented, and remarkably pretty. (B. M. 5562; B. R. 105.)

T. xiphostachys (dagger-spiked).* *fl.* deep rich purple, only one opening at a time; bracts green, becoming tinged with bright yellow, and bright red towards the base, closely placed, sharply cymbiform; spike singularly flattened, solitary, 6in. long, 1in. broad. August. *l.* 9in. to 12in. long, from a broad, convex base, gradually tapering to a subulate point, entire, dark glaucous-green; lower ones purplish at base. Mexico and Venezuela 1861. SYNS. *T. complanata* (B. H. 1872, 23), *Vriesia xiphostachys* (B. M. 4287).

T. zebrina (zebra-striped). A garden synonym of *T. splendens.*

TILLETIA (named in honour of Matthieu Tillet, a French botanist of the eighteenth century). A genus of Fungi, parasitic on grasses. The most conspicuous species (*T. Caries* = *T. Tritici*) is found in the ovaries or immature fruits of the various kinds of Wheat, which it fills with a mass of dark brown spores. Externally, the grains look quite healthy, or may be distinguished from the ripe fruits only by their dull green colour; but their whole interior is occupied by the spores of the Fungus, and, on being crushed, they are found to be greasy to the touch, and to emit a disagreeable smell. Under the microscope, the spores are seen to be globular, with a network of ridges over the surface. The diseased condition of the Wheat is known to farmers by the names "Bunt," "Stinking Rust," "Stinking Smut," or "Pepper-brand." On germinating, each spore emits a thread of mycelium, which bears on its tip a circle of slender conidia, united in pairs by cross-branches. The conidia fall, and produce mycelium, on which grow other conidia, from which mycelium is emitted; and on this the spores are formed. Several other species of *Tilletia* grow in the ovaries of grasses, *e.g.*, *T. Lolii* in *Lolium remotum*, *T. Secalis* in Rye (*Secale cereale*), &c.; while others form dark brown streaks in

Tilletia—*continued.*

the leaves of several grasses; *T. striæformis* is the commonest of the latter species. It has been asserted, but not confirmed, that the use of bunted meal causes disease.

Treatment. The infected grain may be steeped in solutions, *e.g.*, of 1 per cent. of carbolic acid in water, or of potassium permanganate, or of sodium sulphate; in the latter case, it should then be dusted with quicklime, and allowed to dry.

TIMMIA. A synonym of **Cyrtanthus** (which *see*).

TINANTIA (called after Tinant, a Belgian botanist). ORD. *Commelinaceæ.* A small genus (three species) of stove or hardy, erect herbs, natives of tropical America. Flowers pedicellate at the sides of the branches; cyme on a terminal peduncle. Leaves mediocre or ample. The under-mentioned plant is a half-hardy, perennial herb, closely allied to *Tradescantia.* It thrives in any well-drained, loamy soil. Seeds may be either sown in a warm, sunny spot in the open ground, in spring, or germinated in heat, and the seedlings hardened off and planted out; but it also thrives as a greenhouse plant.

T. fugax erecta (fugacious, erect). *fl.*, petals blue or purplish; pedicels conspicuously bracteolate at base; peduncle villous, one to three-parted at apex, the branches umbellate. July. *l.* ovate-lanceolate, pilose above, glabrous beneath, narrowed at base, slightly petiolate, longitudinally striated. Stem glabrous. *h.* 1½ft. 1794. SYNS. *Tradescantia erecta* (B. M. 1340), *T. latifolia* (L. B. C. 1300), *T. undata* (B. R. 1403).

TINEA (of Sprengel). A synonym of **Prockia** (which *see*).

TINEINA (from *tinea*, a clothes-moth). A very extensive division of small **Moths** (which *see*), most of which may be readily distinguished from the division **Tortricina** (which *see*) by the narrow wings, almost always fringed with long scales on the inner and hind margins, the hairless eyes, the thickened bases of the antennæ, and the upturned terminal joints of the palpi. They differ very greatly among themselves in form, colour, and habits, and even in size, some of the larger ones measuring nearly 1in. across the fore wings, while many of them do not exceed ¼in. across; in fact, the smallest known species of Moths belong to this division. The number of species is very great; and it is not possible to enter into details with regard to them individually. Hence, special reference must be confined to only a few of the species of most importance to horticulturists.

FIG. 40. SMALL ERMINE MOTH (*Hyponomeuta padella*). Twice natural size.

Most of the larvæ have six true legs, and ten suckers or prolegs; but in one genus there are twelve suckers, in others only eight, and in some the larvæ are entirely footless, and live in burrows in the leaves or other organs of plants. Some of the larvæ feed on the surface of the plants, exposed to view, or protected by a case fitting closely around the body. Most of them, however, live concealed, either in webs or in masses of flowers and seed vessels spun together, or, as already mentioned, in burrows in stems, leaves, or fruits; and some are but too well known because of their ravages on clothes, and on articles of furniture.

Among the genera most destructive in gardens is *Depressaria*, several species of which are hurtful to Carrots and Parsnips, and are described among the insect foes of these plants. Some of the species in this genus reach a span of nearly 1in. across the fore wings, and are thus among the largest of the *Tineina.* The genus *Tinea* includes a considerable number of species, several of which feed in clothes, in furniture, or on Cereals, &c., stored in granaries and warehouses; but none are conspicuously hurtful in gardens. An account of *Hyponomeuta padella*, and its ravages on Hawthorn, is given under **Hawthorn Caterpillars.** The genus *Hyponomeuta* includes a few species, all easily recognised by three or four longitudinal rows of black dots on the white or grey fore wings (see Fig. 40); but the larvæ of *H. padella* alone are ever seriously injurious in gardens. Their habit of living in society, in a web (see Fig. 41) renders them very conspicuous, and it is easy to remove and destroy entire colonies. **Plutella cruciferarum** (which *see*) does a good deal of harm to Cabbages and Turnips. *Endrosis fenestrella* is one of the most abundant of clothes-moths in houses, appearing almost throughout the year. It may be known by the snowy-white head and thorax, and dirty-grey wings, clouded with darker markings. The leaf-miners are very numerous; indeed, there are few trees or shrubs that are not infested by several, or even by many, species; and there are also many leaf-miners that burrow in the leaves of herbs of various kinds: *e.g.*, several live in *Epilobium angustifolium* and its congeners. The mines and blotches produced by these insects render the leaves unsightly, but are seldom so numerous as to materially weaken the plants.

FIG. 41. LARVÆ AND WEB OF SMALL ERMINE MOTH (*Hyponomeuta padella*).

Treatment. If the plants are suffering from the abundance of leaf-mining larvæ upon them, or if their beauty is

Tineina—*continued.*

materially impaired thereby, the mined leaves should be picked off with the larvæ still in them; or the larvæ may be crushed in the leaves between the finger and thumb. The habits of life of other injurious *Tineina* are so various that no general statement of treatment would be of much service, and reference should be made to the methods advised under the special headings quoted above.

TINNEA (named in honour of Mdlle. Tinné, Nile voyager). Ord. *Labiatæ.* A small genus (four or five species) of tall, pubescent or woolly, stove herbs or undershrubs, natives of tropical Africa. Flowers fuscous- or violet-purple, fragrant; calyx ovoid, bilabiate; corolla tube short and broad, the limb sub-bilabiate, the upper lip emarginate or two-lobed, the lower one much longer and spreading; stamens four; whorls often loose, two-flowered, axillary or disposed in a terminal raceme; pedicels bibracteolate. Leaves entire; floral ones conformed, the upper ones reduced to bracts. Only one species has been introduced. It thrives in any light, rich soil. The plants should be grown in a light, airy place, and frequently pinched to induce a bushy growth. Propagation may be effected by cuttings, which root readily.

T. æthiopica (African).* *fl.* copiously produced in the upper axils, two or three to a peduncle; corolla dark maroon-purple, the broad tube a little longer than the calyx. Winter. *l.* on short, slender petioles, ovate, sub-acute or acute, quite entire, narrowed at base. Stems and branches erect, terete, ribbed, twiggy. *h.* 4ft. to 6ft. 1867. A hoary sub-shrub. (B. M. 5637.)

T. æ. dentata (toothed). *fl.*, calyx large, cylindrical, two-lipped, inclosing the whole of the corolla tube. *l.* opposite, elliptic, slightly toothed. 1884. (B. M. 6744.)

TINUS. Included under **Viburnum** (which *see*).

TIPULA. *See* **Tipulidæ.**

TIPULARIA (from *tipula*, a Daddy-long-legs; in allusion to the shape of the flower). Syns. *Anthericlis, Plectrurus.* Ord. *Orchideæ.* A small genus (two closely-allied species) of terrestrial Orchids; one is North American, and the other Himalayan. Flowers rather small, loosely racemose, pedicellate; sepals and petals free, narrow; lip sessile, with small lateral lobes and a flat middle one. Leaves ovate. The species have no horticultural value.

TIPULIDÆ. A family of two-winged flies (*Diptera*) distinguished by the long, slender body, with long, unarmed legs, and long, rather narrow wings, with many veins. There is a distinct furrow on the back of the thorax, between its front and middle segments. The head is usually rather small and round, and bears rather long antennæ, which have from six to nineteen joints. One of the commonest species, the Common Crane Fly

Fig. 42. Tipula oleracea.

(*Tipula oleracea*), is shown, of the natural size, at Fig. 42. The larvæ of *Tipulidæ* are popularly known as "grubs," and under that name are but too well known to farmers, as they are among the worst enemies of the cultivated crops, and of pastures. They are dirty-grey, cylindrical maggots, with no distinct head or feet. The rings are separated by shallow grooves. The body is blunt behind, but bears six small, fleshy tubercles on the blunt end. The "grubs" are clumsy creatures, and move slowly, but are protected from injury by their tough skin, which has procured them the name of "Leather-jackets" in some localities. They are of various sizes, when full grown, as there are numerous species. The larvæ of *T. oleracea* reach a length of over 1in., with a thickness of about ⅕in. They live in the soil, a little way below the surface, feeding on the roots of grasses and other plants. When numerous, they not unfrequently destroy the grasses on lawns, or devour great part of the garden and field crops. The produce of damp soil is peculiarly apt to suffer from their ravages. When full fed, they change into pupæ, which are of nearly the same size as the larvæ, but are provided with cases on the front part of the body for the wings and legs of the future Crane Fly. The rings of the abdomen of the pupæ each bear a transverse row of short, stiff spines; and, by means of these, the pupæ can wriggle partly out of the soil, just before the flies are ready to break out, to permit their more easy exit. There are many species of *Tipula*, but there is no need to describe them in detail, as all show much the same habits, and must be combated by the same methods.

Treatment. The female flies are prevented from laying eggs, and the larvæ may be destroyed, by the employment of dressings of such materials as gas lime or soaper's ashes. Common salt has also been found useful, in the proportion of about half a ton to the acre, just before the ground is ploughed. Deep ploughing is very beneficial. To enable the crops to resist attacks, the most effectual method is to stimulate growth by dressings of guano or other manures, so as to render the plants less liable to serious injury, even if partially eaten. The use of heavy rollers has been recommended for lawns, and this would probably kill those grubs that lie close to the surface; but they are not very liable to injury from pressure, unless it is very considerable.

Traps, as recommended under **Crane Fly** (which *see*), consisting of slices of turnip, potato, or other fleshy roots or tubers, may be employed with success for the protection of choice plants or crops. They should be sunk a few inches below the surface of the soil, and be examined every two or three days, the grubs found in them being removed and destroyed.

Certain birds, especially starlings and rooks, are very useful in reducing the number of grubs, of which they eat multitudes: they ought, therefore, to be encouraged. Among the most productive breeding-grounds of grubs (as well as of other pests of gardening and of agriculture) are uncultivated corners or edges of shrubberies and fields, where weeds are allowed to grow unchecked from year to year. It is advisable to get rid, as thoroughly as possible, of such sources of trouble.

TISSUE. The material of which the elementary organs of plants are constructed, whether consisting of membranes, bladders, cells, or fibres.

TITHONIA (a name of mythological derivation, from Tithonus, the favourite of Aurora). Ord. *Compositæ.* A small genus (four or five species) of half-hardy, robust, annual herbs, or sometimes shrubby at base, natives of Mexico, Central America, and Cuba. Flower-heads yellow, large, heterogamous, on long, thickened peduncles; ray florets ligulate, spreading, entire or scarcely bidenticulate; involucre hemispherical or broadly campanulate, the bracts biseriate; receptacle convex; achenes slightly pilose. Leaves alternate, petiolate, entire or three-lobed. The species here described thrive in any light soil. Propagated by seeds.

Tithonia—*continued.*

T. ovata (ovate). A synonym of *Zexmenia ovata.*

T. speciosa (showy). *fl.-heads,* involucral bracts leafy; ray florets about twelve or thirteen, rich red; peduncles one-headed, thickened above. August. *l.* petiolate, cordate, undivided or crenately three-lobed. Stem erect, terete. *h.* 4ft. Mexico, 1833. SYN. *Helianthus speciosus* (B. M. 3295).

T. tagetiflora (Marigold-flowered). *fl.-heads* orange-yellow; ray florets oval-oblong; involucre velvety, erect; peduncles thickened at apex. August. *l.* usually trilobed. *h.* 6ft. Vera Cruz, 1818. (B. R. 591; R. H. 1858, f. 64.)

T. tubæformis (tube-like). *fl.-heads,* ray florets oblong; involucre hairy, somewhat spreading; achenes usually biaristate; peduncles thickened at apex. July. *l.* all undivided. *h.* 5ft. Mexico, 1799. (B. R. 1519, under name of *Helianthus tubæformis.*)

TITHYMALUS. A synonym of **Euphorbia** (which *see*).

TITRAGYNE. A synonym of **Rohdea** (which *see*).

TITTMANNIA (of Reichenbach). Included under **Vandellia** (which *see*).

TOAD (*Bufo vulgaris*). There are few more useful animals in a garden than the common Toad, despite the prejudices with which it has so long been regarded, and which are, even yet, hardly extinct in some minds. It is, however, scarcely necessary, in the present day, to waste words to disprove the belief, so widely prevalent in the past, that the Toad is venomous. It is perfectly harmless to human beings. It is of much value in a garden, from the fact that it feeds largely on insects and slugs. During the day, Toads shelter themselves under stones, or in holes in the soil; or, in default of these, they will retreat to the shade of broad-leaved plants. The night is their time for movement and for taking food; though a dull, wet day will also tempt them out. Despite the slowness of their motions, they are able to capture the most active insects. This is done by means of the tongue, which can be shot forth from the mouth to a surprising distance.

TOADFLAX. *See* **Linaria.**

TOAD FLOWER, AFRICAN. A common name for several species of *Stapelia.*

TOAD STOOL. A common name for poisonous Fungi.

TOBACCO. *See* **Nicotiana Tabacum.**

TOCOCA (*Tococo* is the name of *T. guianensis* in Guiana). Including *Sphærogyne.* ORD. *Melastomaceæ.* A genus comprising about thirty species of glabrous or hispid-pilose, stove shrubs, natives of North Brazil, Venezuela, and Guiana. Flowers white or pink, rather large, paniculate, naked or included in ample bracts; calyx tube terete or costate, the limb dilated, five or six-lobed; petals five or six, obovate or oblong, obtuse or retuse; stamens ten or twelve, equal. Leaves petiolate, ample, membranous, rarely coriaceous, entire or denticulated, five-nerved, often having on the base or on the petiole a two-lobed, inflated bladder. The species known to cultivation are here described. They thrive in a compost of one part sandy loam and two parts rough peat. Cuttings of side shoots should be inserted in February.

T. ferruginea (rusty). *l.* three-ribbed, elliptic-oblong, shortly acuminate, shaded green on the upper surface, paler beneath, the younger ones stained with red. Stem terete, clothed with cinnamon-coloured scurf. South America, 1868. SYN. *Sphærogyne ferruginea.*

T. guianensis (Guiana). *fl.* shortly pedicellate or sessile; calyx limb entire; petals whitish-pink, obovate-cordate, inequilateral; panicle terminal. August and September. *l.* very variable in size and shape; broadly elliptic or ovate, shortly acuminate, rounded at base, very slightly denticulated; petioles scarcely ½in. long beneath the bladder. *h.* 3ft. to 4ft. Guiana, 1826.

T. imperialis (imperial). *l.* large, elliptic, of a rich dark green, having a silky or velvety surface, and with the principal veins reddish at the base. Peru, 1869. A very handsome plant. SYN. *Sphærogyne imperialis.*

T. latifolia (broad-leaved). *fl.* very shortly pedicellate; petals of a beautiful pink or red; panicle terminal, more or less contracted, the branches slender. *l.* long-petiolate, broadly ovate, apiculate, entire or inconspicuously dentate-ciliated below the apex, rounded at base. Stem simple. Equinoctial America, 1862. SYN. *Sphærogyne latifolia.*

TOCOYENA (said to be the name of this plant in Guiana). SYN. *Ucriana.* ORD. *Rubiaceæ.* A genus comprising about eight species of erect, glabrous or tomentose, stove shrubs, natives of Brazil and Guiana. Flowers white or yellow, showy, cymose, sub-sessile; calyx five-toothed, persistent; corolla funnel-shaped, the tube slender, the throat naked; limb of five spreading, obtuse, contorted lobes; stamens five, inserted in the throat of the corolla; peduncles short and thick. Berry oblong, many-seeded. Leaves opposite or nearly so, shortly petiolate, ovate or lanceolate; stipules small, acute. *T. longiflora,* the only species known to cultivation, thrives in fibry peat, with the addition of a little lumpy loam, sand, and charcoal. It may be multiplied by cuttings of half-ripened shoots, inserted in sand, under a glass, in heat, during May.

T. longiflora (long-flowered). *fl.* sub-sessile, aggregated; calyx tube turbinate; corolla 8in. to 9in. long, the tube yellow, the limb white. *l.* lanceolate-oblong, acuminate at both ends, glabrous, 1ft. long, 4in. to 5in. broad; stipules triangular. Stem tetragonal, very simple. *h.* 6ft. Guiana, 1826. (A. G. 50.)

TODAROA (commemorative name). *Campylocentron* is now the correct name. ORD. *Orchideæ.* A genus comprising about fifteen species of stove, epiphytal Orchids, natives of tropical America. Flowers minute, spicate, often distichous; sepals and petals free, narrow; lip sessile at the base of the column, produced in a spur at base; column very short. Leaves distichous, often scattered, oblong, linear, or terete. Stem occasionally leafless, not pseudo-bulbous. Only one species calls for description here. For culture, *see* **Angræcum.**

T. micranthum (small-flowered). *fl.* white; sepals and petals spreading at apex; lip conformed, bilobed; spur obtuse, incurved; spike secund, many-flowered, horizontal, shorter than the leaves. February. *l.* 1½in. long, oblong, three-nerved, oblique at apex. Stem short. 1836. (B. R. 1772, under name of *Angræcum micranthum.*)

TODDALIA (*Kaka Toddali* is the Malabar name of *T. aculeata*). Including *Scopolia* (of Smith), *Vepris.* ORD. *Rutaceæ.* A small genus (six to eight species) of unarmed or prickly, climbing or sarmentose, stove shrubs, dispersed over the tropics of the Old World and the Cape. Flowers in axillary or terminal cymes or panicles; calyx short, two to five-toothed, lobed, or parted; petals two to five, imbricated or valvate; torus inconspicuous or slightly elongated. Leaves alternate, trifoliolate; leaflets sessile, lanceolate, coriaceous, entire or crenate, pellucid-dotted. Three species have been introduced, all natives of Mauritius. They are interesting shrubs, thriving in a compost of loam, peat, and sand. Propagated readily by cuttings, inserted in sand, under a glass, in heat.

T. aculeata (prickly). Lopez Root. *fl.* white; panicles shorter than the leaves, pilose, many-flowered. May. *l.,* leaflets oblanceolate-oblong, acute, ½in. to 1in. broad, entire or obscurely crenate, the edges wrinkled; petioles 1in. long, flattened upwards. 1790. A climber, often armed with hooked prickles. (B. M. Pl. 49.)

T. lanceolata (lance-shaped). *fl.* white, on short pedicels; panicles many-flowered, axillary and terminal, thyrsoid. May. *l.,* leaflets oblong-lanceolate, 2in. to 3in. long, acute, entire, the edges waved; petioles 1in. to 2in. long, not flattened. *h.* 4ft. and upwards. 1824. An erect shrub. SYN. *Vepris lanceolata.*

T. paniculata (panicled). *fl.* greenish-white, in copious, deltoid, terminal panicles, with spreading or ascending branches. May. *l.,* leaflets obovate-oblong, obtuse or sub-acute, 1in. to 1½in. broad, bright green; petioles 1in. to 1½in. long, sub-terete. *h.* 20ft. to 30ft. 1824. An erect, unarmed shrub.

TODDY PALM. A common name for **Caryota urens** (which *see*).

TODEA (named in honour of Henry Julius Tode, of Mecklenburg, 1733-1797, an experienced mycologist). Crape Fern. Including *Leptopteris* (of Presl). ORD. *Filices*. A genus comprising about five species of greenhouse Ferns, almost confined to the South temperate zone, having the capsules of *Osmunda*, but the ordinary habit of *Polypodium*. Sori on the back of the leafy part of the frond. Todeas thrive in the cool house, and prove very ornamental if planted in moist, sheltered places in the open fernery. If rapid growth be desired, the plants should be grown in the tropical fernery, in a close case. The best soil is one composed of fibrous peat and silver sand. Ample shade must be afforded, and the fronds frequently moistened by sprinklings of water. *See also* **Ferns.**

T. africana (African). A synonym of *T. barbara*.

FIG. 43. PORTION OF FROND, WITH BARREN AND FERTILE PINNÆ, OF TODEA BARBARA.

T. barbara (Barbary).* *cau.* sub-arborescent. *sti.* 1ft. or more long, stout, erect, quadrangular, quite naked. *fronds* 3ft. to 4ft. long, often 1ft. broad; pinnæ close, erecto-patent, 1in. to 1½in. long, ⅛in. to ¼in. broad, the edge more or less distinctly toothed, the upper ones connected at the base. *sori* dense, when mature filling up the whole under surface of the pinnules on which they are placed. Australia and New Zealand, 1869. See Fig. 43. (B. M. 5954.) SYNS. *T. africana*, *T. rivularis*.

Todea—*continued.*

12in. broad, tripinnatifid; pinnæ close, lanceolate, 4in. to 6in. long, ¾in. to 1¼in. broad, the rachis winged only towards the apex, the lowest about equal to the others; pinnules close, linear-

FIG. 45. TODEA SUPERBA.

oblong, ½in. to ¾in. long, ¼in. broad, cut down nearly to the rachis into erecto-patent, simple or forked, linear segments; rachises naked or slightly tomentose. New Zealand. See Fig. 44. (H. G. F. 54.) SYN. *T. pellucida*.

FIG. 44. TODEA HYMENOPHYLLOIDES, showing Habit and detached Pinna.

T. Fraseri (Fraser's). *cau.* erect, woody, 1½ft. to 2ft. high, 1½in. to 2in. thick. *sti.* 6in. to 9in. long, firm, erect, naked. *fronds* 1ft. to 2ft. long, 8in. to 12in. broad, bipinnate; pinnæ close, lanceolate, 4in. to 6in. long, ¾in. to ⅞in. broad, with a narrowly-winged rachis, the lowest about equal to the others; pinnules linear-oblong, ⅓in. long, ⅛in. to ⅙in. broad, sharply toothed, the rachises naked. Australia, 1861. SYN. *Leptopteris Fraseri*.

T. F. Wilkesiana (Wilkes'). *fronds* larger than in the type; lower pinnæ rather shorter than the others, and deflexed; rachises slightly pilose. Fiji and New Hebrides, 1870.

T. hymenophylloides (Hymenophyllum-like).* *sti.* tufted, 6in. to 12in. long, firm, erect, naked. *fronds* 1ft. to 2ft. long, 8in. to

T. h. compacta (compact). A variety far closer and denser in form than the type.

T. pellucida (pellucid). A synonym of *T. hymenophylloides*.

T. rivularis (brook-loving). A synonym of *T. barbara*.

T. superba (superb).* *cau.* erect, woody, 1ft. to 1½ft. high. *sti.* 2in. to 3in. long, firm, erect, naked. *fronds* 2ft. to 4ft. long, 6in. to 10in. broad, tripinnatifid; pinnæ close, narrow-lanceolate, the central ones 4in. to 5in. long, ¾in. broad, the lower ones gradually reduced; pinnules close, linear-oblong, ¼in. to ⅜in. long, cut down nearly to the rachis into erecto-patent, simple or forked, linear segments; rachises densely tomentose. New Zealand, 1861. A splendid plant for exhibition purposes. See Fig. 45.

TOFIELDIA (named in honour of Tofield, a Yorkshire botanist). False Asphodel. SYNS. *Hebelia, Heriteria*. ORD. *Liliaceæ*. A genus comprising about fourteen species of mostly hardy, perennial herbs; two are natives of the Andes, and the rest are broadly dispersed over mountainous and temperate regions. Flowers small, shortly pedicellate or sub-sessile, in terminal spikes; perianth persistent, the segments distinct or very shortly connate near the base; stamens six. Leaves radical or clustered at the base of the stem, short-linear, sub-distichous; cauline ones few or none. *T. palustris* is a native of Britain, but of no particular beauty. *T. pubens*, the only species calling for mention here, thrives in any light soil, in a moist situation. It may be increased by division of the roots.

T. pubens (downy). *fl.*, perianth whitish, two lines long, raceme loose, 2in. to 4in. long. July. *l.* radical, narrow-linear, somewhat rigid, glabrous, 6in. to 12in. long. Stem slender, 1ft. to 2ft. high. North America, 1840. (B. M. 3859.)

TOLMIEA (dedicated by Torrey and Gray to Mr. Tolmie, surgeon of the Hudson's Bay Company at Puget Sound). ORD. *Saxifrageæ*. A monotypic genus. The species is a hardy herb, with a perennial rhizome. It was formerly included under **Tiarella** (which *see* for culture).

T. Menziesii (Menzies'). *fl.* greenish, rather large, nodding, in a slender, elongated raceme; calyx purple-nerved; petals five, capillary. April. *l.*, radical ones petiolate, alternate, incised-lobed; cauline ones alternate. Stem 1ft. to 2ft. high, three to five-leaved, hairy. North-west America, 1812. SYNS. *Heuchera Menziesii, Tiarella Menziesii* (H. F. B. A. i. 80).

TOLPIS (a name given by Adanson, probably without meaning, as was his custom). ORD. *Compositæ*. A genus comprising less than eighteen species of pretty, hardy, annual or perennial herbs, rarely with a slightly woody caudex, natives of the Mediterranean region and the Canary Islands. Flower-heads pale or bright yellow, homogamous; ray florets truncately five-toothed at apex; involucre campanulate; bracts narrow, the lower ones one or two-seriate, the upper ones in many series; receptacle naked or honeycomb-like. Leaves mostly radical, or alternate on the lower part of the stem, entire, toothed, or pinnatifid, the upper ones often narrow. The following species, which are those best known to cultivation, are well suited for the ornamentation of flower borders, where the seed may be sown in spring. All flower in June.

T. altissima (very tall). A synonym of *T. virgata*.

T. barbata (bearded). Yellow Garden Hawk Weed. *fl.-heads*, involucre slightly farinose, the outer scales subulate-falcate. *l.* lanceolate, toothed. Stems erect, branched, leafy. South Europe, &c. SYN. *Crepis barbata* (B. M. 35).

T. macrorhiza (large-rhizomed). *fl.-heads* nearly as large as those of *T. barbata*, disposed in an ample panicle; involucre farinose-pubescent; pappus of fifteen to twenty bristles; pedicels squamellose. *l.* undivided, oblong, toothed, sessile, slightly fleshy-coriaceous. Stems shrubby, branched; root thick, fleshy. Madeira. Plant highly glabrous. SYN. *Crepis macrorhiza* (B. M. 2988).

T. umbellata (umbel-flowered). *fl.-heads* pale yellow, one-half smaller than those of *T. barbata*; peduncles tomentose at apex. *l.* oblong-linear, toothed; upper ones entire. Stems erect, branched, nearly naked. *h.* 2ft. South Europe, 1820.

T. virgata (twiggy). *fl.-heads* small; pappus of six to ten bristles; involucre and pedicels farinose-pubescent. *l.* elongated, linear-lanceolate, toothed; upper ones linear, entire. Stem erect, branched, glabrous. *h.* 3ft. South Europe, &c., 1823. SYN. *T. altissima*.

T. v. grandiflora (large-flowered). *fl.-heads* citron-colour; involucre mealy, the outer scales short and subulate. *l.* radical, lanceolate, toothed, sparsely hairy, densely villous towards the base. South Italy, Sicily, &c., 1830.

TOLU BALSAM-TREE. *See* **Myroxylon Toluiferum.**

TOLUIFERA. A synonym of **Myroxylon** (which *see*).

TOMATO (*Lycopersicum esculentum*). A tender annual, native of South America, cultivated for the use of its fruit for cooking as a vegetable, as an ingredient in salads, for making Tomato sauce, and for various other culinary purposes. The fruits are sometimes used in a green, but more generally in a ripe, state. In most gardens of extent, the Tomato is considered one of the most important vegetables grown, and the keeping of a continued supply, if possible, throughout the whole year, is a point to be specially aimed at. For marketing, Tomatoes are very extensively cultivated, as they invariably command a good price, except, perhaps, for a limited period when the general crop is being harvested at the end of summer. The annual supply grown in this country for market purposes is nothing like equal to the demand, and large quantities of fruits are imported. Of late years, a considerable number of establishments have sprung into existence in which Tomatoes are cultivated (planted out) under glass on a vast scale; and while the demand for their produce is good, and more likely to increase than diminish, it proves, as a rule, a remunerative undertaking, and one which promises to continue so. In this country, it is only in warm situations, and in favourable localities, that the Tomato crop can be depended upon in the open air, though much depends on the season — whether it be a hot and dry, or a cold and wet one — and the strength of the plants when placed outside. Plants raised under glass, and grown to a good size, large enough to begin flowering, or even setting fruit, before being put out into their permanent quarters, have a manifest advantage over others which are not so prepared, in perfecting a crop afterwards. Indoors, Tomatoes may be grown to bear freely in large pots or boxes, or they may be planted in a ridge of soil, and trained to a trellis, or nailed against the back wall of a melon or cucumber house, provided there is sufficient light.

Tomatoes may be increased in any quantity from seeds, which ripen in abundance in most of the fruits that reach maturity; or they may be raised from cuttings, which is sometimes an advantage, as these root readily in heat, and soon grow to a fruiting size. Seeds intended for raising plants for the open air should be sown at the end of February, or during March, in 5in. pots, or in shallow pans, filled with light soil, and placed in a temperature of 55deg. or 60deg., either in a heated structure, or on a hotbed. As the seedlings come up, they must be kept well exposed to light, to prevent them becoming drawn. When the second leaves appear, they should be potted off singly, and still kept in heat, until re-established, when they may be grown on in any light house or frame, with more air, until gradually they are hardened off for placing outside, towards the end of May, or early in June. If placed singly, at first, in 3in. pots, the plants may be readily shifted into others, 6in. in diameter, some time during April, and this will be sufficiently large for them. Some growers place two plants in a pot, opposite each other, and close to the edge, and then divide the ball when planting out; but it is obvious that this must injure the roots, although, if they are not very much crowded, and due attention is given to watering and, if necessary, shading, for a few days, new growth is soon commenced. As our ordinary summers are not long-lasting, it is most important that the plants be thus forwarded, and special attention given them in training, to induce a fruitful, instead of a too luxuriant, growth. This may best be done by keeping the side shoots pinched out, and limiting each plant to the centre one only, or, at most, to not more than two. Treated in this way, the clusters of flowers which will appear before the plants get up very much will be strong, and — what is of equal or more importance — they will be swelling off at the earliest possible moment. Early ripening, or management with a view to attaining it, is quite a necessity, as it is of little use only having heavy crops at a time when they cannot ripen for want

Tomato—*continued.*

of sun. The best place for Tomatoes outside is a warm south wall; there are generally spaces in such positions, unoccupied by fruit-trees, which cannot be more profitably furnished. Select the places, and add a few spits of turfy soil round each plant when inserting it. The after-treatment consists in keeping the leading shoots tacked up as they lengthen, and in pinching off all the side ones rather frequently—say, once a fortnight—if there are any formed. In dry weather, water should be plentifully given if the plants appear to be in want; but a mulching of loose, leafy manure or litter will, if applied, be of material advantage in preventing this. Fruits, when they commence colouring, should be fully exposed to the sun; this can be done by fastening to one side, shortening, or removing altogether, some of the leaves which prevent the direct exposure to sunlight. When there is danger of frost, any green fruits may be cut and placed on a shelf in a warm house or vinery—if it is kept rather dry, so much the better—where many of the most forward ones will ripen. The plants, and also any part of the crop that is left out, are soon destroyed by frost.

Tomato culture outside, in market gardens, has of necessity to be conducted on a different system, as there are no south walls as in private gardens. The plants are raised in frames, filled with fermenting manure, in early spring, and grown on as sturdy as possible, by allowing them plenty of air on all favourable occasions. Towards the end of May, they are thoroughly hardened off by removing the sashes daily; afterwards, they are planted in one of the most favourable warm positions at command, and still protected until all danger from frost is past. Large Red and Conqueror are two of the most profitable varieties for outside culture, either in private or other establishments: they fruit freely, and the produce is large and ripens well, provided the conditions under which the plants are placed are such as suit Tomatoes outside.

When grown in the open ground, the plants may be trained to strong stakes about 4ft. high, and the side shoots kept well thinned, to allow all the strength to pass into the fruits situated on the main. Where there is lack of wall space, this method of planting may be adopted in any garden; the plants must be strong and well hardened off before putting them out, and the position given them should be well sheltered and one of the warmest at command: a south border is most desirable.

Under glass, and with sufficient heat and space at command, Tomatoes may be had in greater or less quantity all the year round. During summer, when the supply is but uncertain from outside plants, it is always advisable to have some additional plants fruiting indoors, and from these the produce is also superior, because better ripened. The plants may be grown in large pots or deep boxes, or they may be planted out in a narrow bed formed with loose bricks to allow an inside space of about 2ft. Plenty of light is essential; consequently, a span-roofed house is best adapted, although a lean-to answers admirably. Plants raised from cuttings are generally preferred, as they are considered to begin bearing earlier, and are sometimes less vigorous than seedlings, which is an advantage in a limited space; but either plan of propagating may be adopted. Cuttings root very readily, if kept close, anywhere in heat, and either spring or the latter part of summer is the best time for renewing the stock. Young plants bear best, and, as they can be so easily raised, it is preferable to replace old ones rather than keep them after the produce begins deteriorating in size and quality. Ripe Tomatoes are most valued if procurable during the winter and in early spring; the plants intended for bearing at these seasons are, therefore, of much importance. Cuttings, struck in August, in small, single pots, should be grown on and shifted into larger ones as becomes necessary, until a 10in. or 12in. size is reached, which will be sufficiently large for fruiting them in if pot culture is adopted. Even when it is intended to plant in narrow borders or in boxes for fruiting, the plants may first be grown in pots and transferred to their permanent quarters when some of the earlier fruits are set. The mode of training should be that of keeping either to a single stem, or to two main shoots, all side ones being kept removed from the first. These shoots should be supported, from an early stage, with a stake; and a wire trellis, fixed about 9in. or 12in. from the glass, is best to train to afterwards. To get two shoots formed of about equal strength, the plants should be pinched once when from 6in. to 9in. high; and to encourage the production of heavy crops, the extreme points may be taken out after each bunch of fruits shows: new leaders will form readily, and generally additional fruits will appear at their first joints; hence the productiveness at an early stage, and in a small space, secured by this mode of training. This frequent stopping is not a necessity where there is plenty of space for the plant to grow: it will invariably show far more flowers than can be perfected, if the variety is a productive one. When sufficient are set for a crop, the others which appear may be pinched off. To succeed autumn-raised plants, others should be propagated in February, and grown on in pots preparatory to being placed in permanent positions. A night temperature in winter of 55deg. to 60deg., with a rise of 5deg. by day, is not too high for Tomatoes. They need a somewhat similar temperature to winter Cucumbers, with which they are sometimes grown in the same house. If but an occasional dish of ripe fruits can be secured in winter, they are generally much valued; through the dullest season the ripening process goes on but slowly. Throughout the summer, Tomatoes may be grown in almost any glass structure, or in slightly-heated pits and frames, after the latter are cleared of bedding plants, &c., for the season; and the crops thereby obtained are more certain to ripen than those on plants outside, although in private gardens, where a quantity is required, both modes of culture are recommended

Tomatoes need an ample supply of water at all times, particularly when growing in pots or in any limited space. A rough, turfy compost, with a little decayed manure intermixed, will suit them; it is preferable to give manure water, or one of the concentrated artificial manures, when the fruits begin swelling, than to give a very rich compost previously, which would tend to induce too vigorous a growth—perhaps at the expense of productiveness.

Fungi. Tomatoes frequently suffer greatly from the attacks of the Potato-disease Fungus. *See* **Phytophthora** for an account of this parasite, and of the means to be employed against it.

Insects. Tomato-plants are seldom very seriously injured by insects; but in the course of the year 1886 a species of *Aleyrodes* (*see* **Snowy Fly**) proved very destructive, in several localities, to plants in green-houses, and more especially to Tomato and Cucumber-plants. The species now in question was named *A. vaporariorum*, and figured, by Prof. Westwood, in 1856. The larvæ feed on the backs of the leaves, piercing the skin and sucking the juices, like the more common *A. proletella* on Cabbages. The pupæ are also fixed to the leaves; and the perfect insects emerge after a few days spent in the pupal stage. The insects differ from *A. proletella* in having milk-white, unspotted wings and pale yellow bodies. The leaves occupied by them turn yellow, wither, and die. These insects are unable to withstand exposure to the open-air temperature of England; and are supposed to have been brought from Central America or Mexico, with plants of some sort.

Tomato—*continued.*

They have been found on the Continent of Europe, on a large variety of trees and shrubs.

Remedies. The remedies employed should be the same as those found to give good results against **Aphides** (which *see*), which these insects greatly resemble in their habits.

SORTS. Of the somewhat numerous sorts of Tomatoes in cultivation, the subjoined is a selection. For general purposes it is immaterial whether the fruits are smooth,

FIG. 46. RIBBED FRUITS OF TOMATO.

or ribbed, as represented in Fig. 46; but there are many occasions when those of even outline and medium size are specially asked for. It is, therefore, advisable to grow at least one of the smooth kinds.

Acme. Fruit purplish-crimson, handsome, smooth in outline, very distinct in colour. Plant prolific.

Chiswick Red. Fruit bright scarlet, egg-shaped, borne in large clusters. Exceedingly productive, and of good quality.

Conqueror. Fruit vermilion-red, large, handsome, of excellent quality. Early, and one of the best for outdoor culture.

Dedham Favourite. Fruit rich ruby-red, of large size, quite smooth. Productive, and good for exhibition.

Greengage. Fruit of a beautiful citron-yellow colour, when ripe, produced in clusters. The best yellow-fruited variety; very distinct and ornamental.

Hackwood Park Prolific. Fruit scarlet, large, smooth, even in form and size, borne in large clusters. Early, and exceedingly productive.

Hathaway's Excelsior. Fruit fine red, handsome, very smooth and even in outline, firm, and of excellent quality. One of the best.

Large Red. Fruit deep scarlet, very large, flattened and ribbed. Very productive, and well adapted for outside culture.

Orangefield Dwarf. Fruit red, large, frequently much ribbed, of excellent flavour. Plant unusually dwarf, early, and an abundant bearer; one of the best for indoor culture in a limited space and during winter.

Pear-shaped. Fruit red, pear-shaped, very distinct, produced freely in clusters. This variety is ornamental, but not very extensively cultivated.

Stamfordian. Fruit red, smooth, very large, somewhat in the way of TROPHY. Fine for exhibition.

Trophy. Fruit red, exceedingly large and nearly smooth. Productive, but rather late.

CHERRY AND RED CURRANT TOMATOES. These are chiefly grown for ornament, as their fruits are borne in great profusion in bunches or clusters. They represent, in general appearance, the Cherry and Red Currant, after which they are popularly called.

TOMATO, CANNIBAL'S. *See* **Solanum anthropophagorum.**

TOMENTOSE. Covered with tomentum.

TOMENTUM. Dense, rather short, rigid hairs, which are sensibly perceptible to the touch.

TOMEX. Included under *Litsea.*

TOMICIDÆ. A name occasionally employed for the family of Beetles now called **Scolytidæ** (which *see*). The name is taken from *Tomicus*, one of the chief genera in the family.

TONGA-PLANT. *See* **Epipremnum mirabile.**

TONGUE-GRAFTING. Another name applied to Grafting by the whip or splice method—that most generally practised in this country, and with the greatest success when stock and scion are both small and of about an equal size. When preparing the two surfaces that are to fit

Tongue-Grafting—*continued.*

together, a small, thin tongue is cut in an upward direction in the scion, and also a notch the opposite way in the stock, corresponding in size as near as can be judged. In fitting the two together, the notch may be kept open with a knife, and the tongue should be carefully inserted. It acts as a great support to the scion, and materially aids in keeping the latter in position while the bandage is put on, and until the parts unite. By cutting a tongue in this way, and fitting it properly, there are also additional surfaces that may grow together and render the union still more complete. *See also* **Grafting.**

TONGUE GRASS. A common name for **Lepidium sativum** (which *see*).

TONIC. Bracing; corroborative.

TONNINGIA. A synonym of **Cyanotis** (which *see*).

TONQUIN BEAN. *See* **Dipterix odorata.**

TONSELLA. Included under *Salacia.*

TONTANEA. A synonym of **Coccocypselum** (which *see*).

TONTELEA. Included under *Salacia.*

TOOLS, IMPLEMENTS, &c. For gardening purposes, it is customary to provide Tools of all descriptions used in carrying out all kinds of work. On their description and quality depend materially the amount of work that may be accomplished, and also the manner in which it is done; workmen generally do more with good and useful Tools that are always kept clean, than if they had to use others, indifferent in quality and make, or rusted because of being subjected to wet weather or taken in dirty, and neglected while temporarily stored away. This latter is, unfortunately, a too frequent occurrence, sometimes arising from disinterestedness on the part of workmen: the defect might be cured by the adoption of a simple rule by those in charge, which should be applicable to all who use anything from the Tool-shed. Some of the Tools used in gardens are requisite in all establishments, whether conducted on a large or small scale, as, for instance, the spade; this is indispensable at all seasons. It may, therefore, be taken as an example in referring to the importance of having Tools of good quality, even if at a little more expense at first. Inferior articles are most unprofitable, no matter of what description. Tools also need proper usage and to be kept clean. The first of these remarks is commended to the attention and judgment of persons who have to buy or procure Tools; the second to those whose lot it is to subject them to daily or occasional use.

In the subjoined general notes on Tools, Implements, &c., reference is made to requisites which should be found in establishments where gardening work of the ordinary routine is carried out. The extent of a place, and the number of workmen employed, must necessarily be the guide for quantity: no general scheme is applicable. It might seem unnecessary to make reference to what is apparently so familiar in relation to Tools in daily use; but those best known are the most essential, and must therefore be noticed, while many others which are only occasionally required, are none the less requisite, and should therefore be ready at hand.

Averruncator. One of these is most useful in gardens where there are extensive grounds attached, with tall-growing shrubs, standard trees, &c., that need pruning at a considerable height above ground, and yet cannot conveniently be reached by means of a ladder or steps. The Averruncator consists of a hooked blade, which is fixed into the end of a handle, made ready for use in one length, or sometimes in two, with provision for joining them together when requisite. To the fixed hooked blade, another blade with a semicircular cutting

Tools, Implements, &c.—*continued.*

edge is attached, generally riveted; this has a lever, with a cord tied to the end, so that, when the cord is pulled from below, the two blades close, and sever branches—if the wood is not too hard—of nearly, or quite, 1in. in diameter. A spring, which is fastened to the fixed, and also to the lever, blades, separates their cutting edges so soon as the rope is loosened. For pruning or cutting into shape tall trees and shrubs at considerable elevations, this is the most effectual plan, as a workman may stand on the ground, and easily detach branches situated at a height of from 12ft. to 16ft., provided, of course, that the handle is sufficiently long. The cord passes from the lever over a small pulley fixed to the handle, and thus full purchase is secured.

Axe. A small, short-handled Axe is adapted for cleaving blocks of firewood, after they have been sawn into proper lengths; it may also be used for sharpening large stakes, and for many other purposes. It is also advisable to have, in addition, one of a larger size, if such work as tree-felling has ever to be executed.

Bill-hooks. One or more of these are in frequent requisition for sharpening stakes, chopping firewood, cutting down high hedges, large common shrubs, &c. Bill-hooks are made with or without a chopper at the back. They are familiar to everyone, and are in constant use.

Brooms. For outdoor work, sweeping lawns, walks, &c., birch Brooms are most generally used, and are best adapted. In some gardens, these are made in wet weather by the workmen, but Brooms ready for use may be procured in any quantity when this is inconvenient or impracticable. In either case, the wood or a stock of Brooms should be procured in winter before the sap rises; when deferred until this takes place, the twigs are much less tough, and do not last. Brooms, or reserve wood for making them, may best be kept in an open or airy shed, preferably on the cross-beams, where it is dry. For cleaning the floors of glass structures, the ordinary long-handled Brooms generally used in houses are best.

Chisels. In pruning operations, when the pieces to be detached are inconveniently situated for cutting, either with a knife or pruning-saw, Chisels are sometimes used. For this purpose, those employed in gardens are somewhat similar in shape to those used by carpenters. Chisels are occasionally employed for pruning at considerable elevations; they are attached to handles of various lengths. When grafting large tree stocks, by the cleft method, a chisel shaped somewhat like a sharp wedge is employed; this is called a Grafting Chisel. Besides these, a strong, wrenching Chisel is always valuable in a garden, for opening cases, &c., which usually arrive, more or less frequently, by rail.

Crowbars. One of these, at least, is recommended to be kept for making holes wherein to insert strong stakes, or any which cannot conveniently be driven into the solid ground. A round bar of iron, with one end tapered to a point, and the other made wedge-shaped, is most generally employed: the wedge end is sometimes valuable for levering or lifting plants in large tubs and other things which are unusually heavy.

FIG. 47. DAISY GRUBBER.

Daisy Grubbers and Daisy Rakes. For removing Daisies from lawns these tools are employed. The Grubber is an implement about 18in. long, with a handle at one end and a claw at the other (see Fig. 47), for digging up Daisies by the roots. Daisy Rakes have broad teeth with sharp edges (see Fig. 48) that cut off Daisy flowers from lawns, but of

FIG. 48. DAISY RAKE.

course do not destroy the roots. The latter may be used for raking short lawn grass instead of sweeping it with a broom.

Dibbers. These may be made from pieces of ordinary wood, shaped like a right angle, or somewhat like an obtuse

FIG. 49. DIBBER.

angle, and pointed, or from old spade handles; the latter are generally favoured (see Fig. 49). To make them last a long time, the points are sometimes cased with steel, but there is no real necessity for this. Dibbers are of most use where the soil is rather light; in heavy lands, the holes made by them are often smooth inside, and the roots of plants do not so readily penetrate. The uses to which Dibbers are put, for inserting plants, &c., are generally well known. The Potato Dibber has a handle long enough for a workman to use standing upright, and is provided with a piece of wood or iron, which is used as a treadle. This, being fixed at the required distance from the end, insures all the Potato sets being put in at a uniform depth below the surface of the soil.

Edging-iron, or Verge-cutter. A tool used for cutting-out beds in turf and for trimming the edges of walks in flower-gardens, pleasure-grounds, &c., when these are composed of turf. It consists of a sharp-cutting steel blade formed in the shape of a crescent (see Fig. 50), with a socket attached, into which a round handle is fixed, with a cap on the top like that of a spade. There are other kinds of Verge-cutters, but this is the one generally used, and it answers most effectually. It may be guided to cut edges, outlines of beds, &c., in turf, of almost any desired shape.

Forks. Forks of one or more kinds are amongst the most useful implements in gardens: for many purposes,

Tools, Implements, &c.—*continued.*

FIG. 50. EDGING-IRON.

there is nothing which could form an efficient substitute. Forks should always be light: they cannot be readily handled and used when constructed so as to appear heavy when lifted. For digging, either a four or five-tined Fork is best: the latter is generally preferable of the two, as the tines or prongs are close together. Most Digging-forks are made with narrow, steel tines, but a useful kind for such work as Potato-digging has broad

FIG. 51. FLAT-TINED DIGGING-FORK.

ones, as represented in Fig. 51. For digging hard ground, a Fork is not a good substitute for the spade, but when the soil is light and also loose at the bottom it may sometimes be substituted with advantage. In transplanting trees of any description, a Digging-fork with narrow tines should always be used for separating soil which surrounds the roots. Dung-forks are invaluable for turning and mixing litter and leaves, or any light manure. The best are those with either three or four small, steel tines, which pass readily through the manure, and seldom clog when in use. Other kinds of Forks are made for special purposes—as, for instance, very large ones, with four or five long prongs, for loading leaves; and others, with long handles and only two prongs (like those used for haymaking, but stronger), for lifting bundles of straw, wood, &c. There are also small Hand Forks, with three flat prongs, which are useful for plunging plants amongst tan or cocoa-nut fibre.

Grubbing-axe, Pick, and Pickaxe. Whenever there are trees of more than ordinary size to be rooted out by garden workmen, one or more Grubbing-axes should be included in the list of tools. Common Picks are requisite for breaking up the surface of walks, &c., and one end of the pickaxe may also be used for similar purposes. The difference between these had better be explained: the ordinary or common Pick has both of the ends pointed, and cannot, therefore, be used for cutting roots; a Pickaxe has one end pointed, and the other made like a chopper, its edge being in line with the handle; the Grubbing-axe has both ends wedge-shaped for cutting—one being in line, and the other turned cross-

Tools, Implements, &c.—*continued.*

ways, with the handle (see Fig. 52). The ends of all these require, when in constant use, rather frequent attention by a blacksmith; otherwise, they soon get blunt.

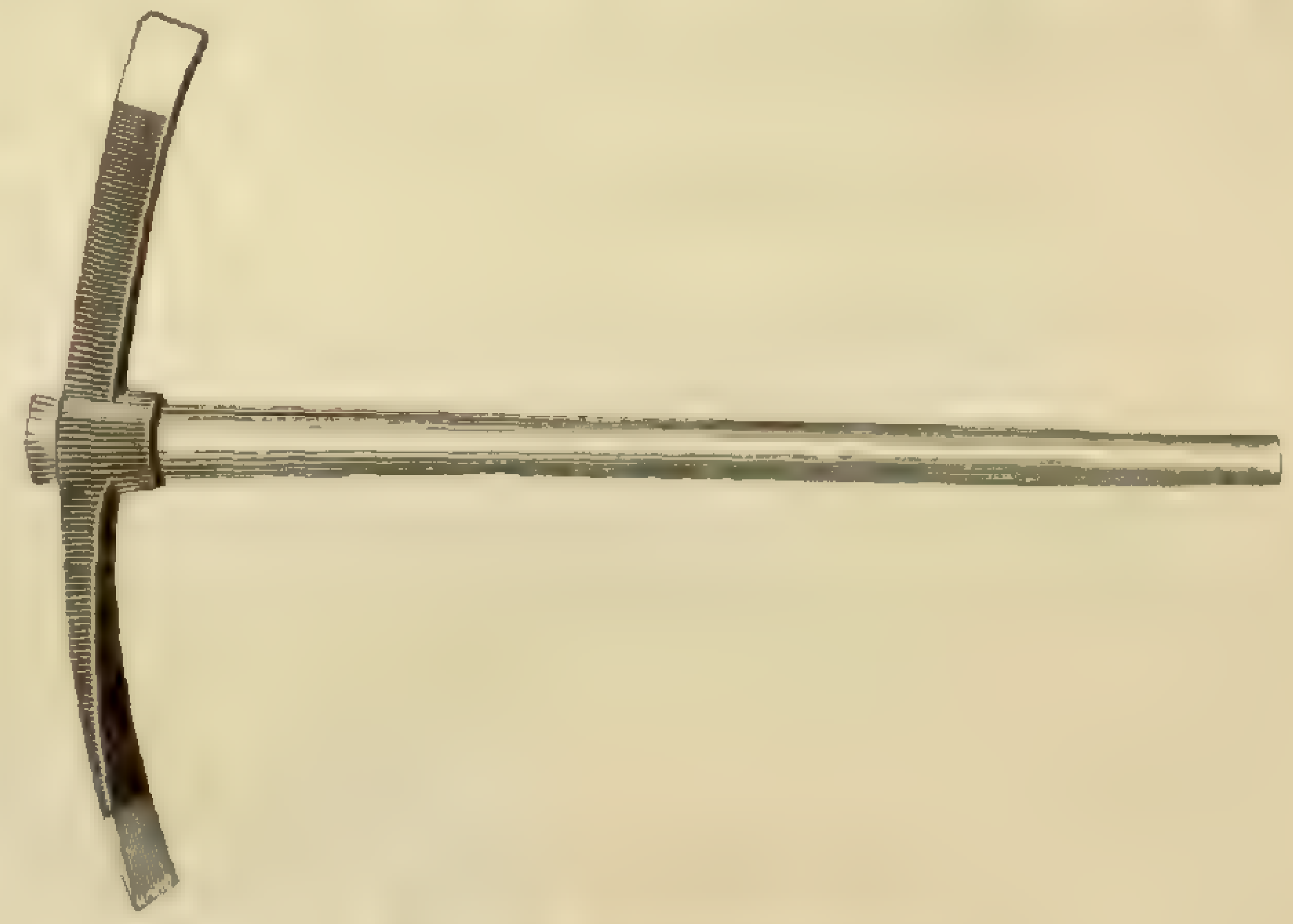

FIG. 52. GRUBBING-AXE.

They should be well steeled and tempered, to make them last as long as possible without being repaired, and to keep the point or edge sharp and in good order.

Hammer. The best form of Hammer for gardening purposes is that with rather a short head, having a claw

FIG. 53. GARDEN HAMMER.

at the back (see Fig. 53), for drawing out old nails when training wall trees. This is the principal use for which Hammers are required.

Hoes. These are requisite in all gardens for many purposes, the forms most employed being the Swan-necked

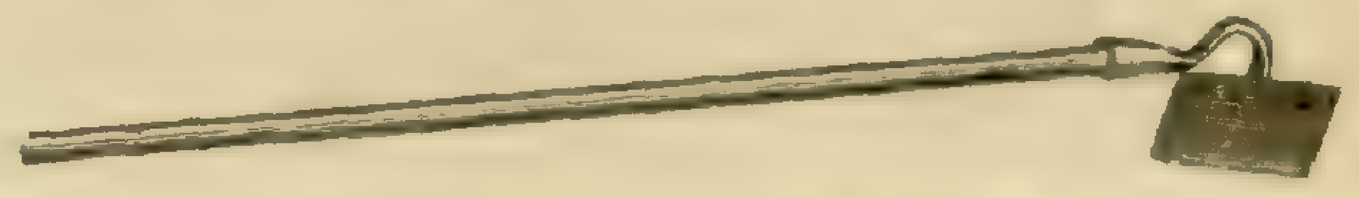

FIG. 54. SWAN-NECKED DRAW-HOE.

Draw-hoe (see Fig. 54), and the Dutch or Thrust-hoe (see Fig. 55). The first-named is better than the old form

FIG. 55. DUTCH OR THRUST-HOE.

of Draw-hoe, which soon gets clogged with soil round the eye, particularly if it is the least sticky or wet. Besides hoeing to destroy weeds, this kind of Hoe, which is made in various sizes, is the best for drawing drills for seeds, earthing-up crops, &c. Dutch Hoes, also made in various widths, are sometimes preferred for breaking up the surface of the ground, hoeing flower-beds, and cutting up small weeds in summer. There are two or three other kinds of Hoes which are not altogether requisite: a reference to these may be found under **Hoes and Hoeing.**

Mallet. A Mallet is useful for driving stakes into the ground, as, for example, those used for Raspberries and young fruit-trees. It is also required when a chisel is used for cutting off branches, &c., and for various other purposes. A moderately heavy one is best adapted, and it should be made from wood that will not readily split.

Rakes. Both iron and wooden Rakes are necessary in gardens, for levelling ground, and for cleaning up refuse of every description. Ordinary wooden ones, such as are

Tools, Implements, &c.—*continued.*

used for haymaking, are best adapted for raking and cleaning large breadths of garden grounds or lawns, and also for levelling gravel. If they are too heavy, the heads may easily be reduced in width and, consequently,

FIG. 56. IRON RAKE.

in weight. Iron Rakes (see Fig. 56) are best for cleaning flower-beds, &c.; it is always advisable to have what is called a set—that is, four or six different ones, varying in width. They should be made light, and not clumsy to handle.

Rammers. These are necessary when new walks are being made, or turf relaid; they are also required occasionally for ramming the soil round posts, &c. The handiest form is that with a circular, iron head, with socket attached into which a handle is fixed. Iron Rammers are made in various sizes: those weighing from 7lb. up to 10lb. are handy, and not too heavy to work.

Reel and Line. For all garden Lines of considerable length, iron Reels should be provided: the Lines are more readily wound up, and they are always subjected to a circulation of air, which dries and preserves them better

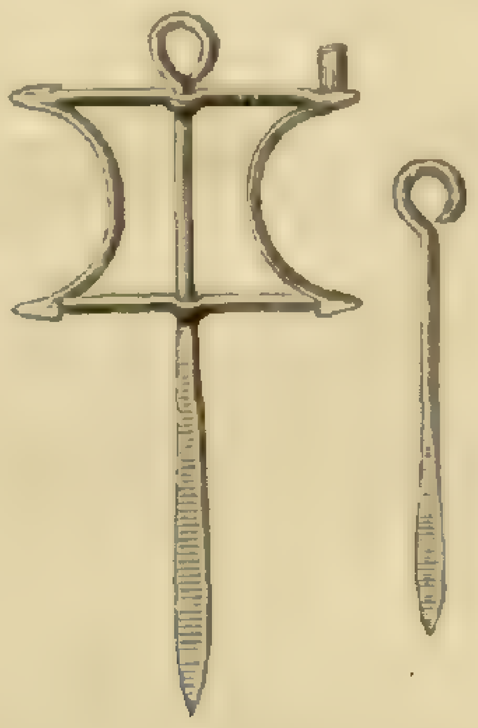

FIG. 57. LINE REEL AND PIN.

than when rolled upon straight, wooden stakes. All Reels should be provided with a small handle projecting above the upper crossbar for turning it to wind up the Line. A strong iron pin accompanies the Reel, for tying the line to at one of the extreme ends, the other end being fastened to the reel before winding (see Fig. 57).

Rollers. Where there are walks and lawns, one or more Rollers are needed to keep the surfaces even and firm. They are made in various sizes, and, consequently, of different weights, usually of cast, but sometimes of wrought, iron. Some have the cylinder in two halves, which revolve separately, and allow of turning more readily at the end of a walk, or in another direction to that which has previously been traversed, than if there was only one. When rolling newly-gravelled walks, it is best to have two Rollers—one, a light one, for drawing first, and another, heavy, for rendering the walk firm. All Rollers should be provided with a balance for the handle; otherwise, the weight of this comes on the workman, who should only have to pull. The balance, besides effecting the purpose for which it is intended, also adds to the weight of the Roller.

Scythes. For mowing under trees, round shrubs, and on sloping banks and in places where the mowing machine cannot be used, Scythes are requisite; they may also, of course, be used for lawns, but are far inferior to a machine. The ordinary form of Scythe and handle answers very well, although workmen who have been accustomed to cut long grass cannot at first succeed in properly cutting lawns. The two projecting handles should be regulated for, or by, each person who intends

Tools, Implements, &c.—*continued.*

using the Scythe, as it is generally necessary to vary their positions to suit individuals.

Shears. Of these there are several kinds, the most necessary being those used for grass-edging, hedge-trimming, and pruning. Grass-edging Shears of the ordinary make, with handles about 3ft. long, are best adapted for general use; the handles should be set on a wider angle than a right angle, taking the cutting blades for the base line. This places the workman, when using the shears, a little behind the blades, and thus enables him to perform his work more effectually. Hedge-trimming Shears have blades nearly equal in length to the handles, 10in. to 12in., and are about 2in. in width; they are used with both

FIG. 58. SMALL HAND SHEARS.

hands. Small Shears (see Fig. 58), for using with one hand, are invaluable for trimming any kind of edgings on a small scale, and for clipping plants which sometimes need it in carpet bedding and other designs. Pruning Shears vary in size according to the dimensions of branches they are intended to cut, from those used easily with one hand, to others, some 3ft. in length (generally called Parrot-bill Shears), that are adapted for severing branches of nearly 2in. in diameter when the wood is not hard.

Shovels. These are preferable to spades for shifting or loading loose soil, sand, gravel, &c. The handiest Shovels for gardens are those of medium size, with a square point, and the side edges slightly turned up. The handle should have more bend in it than that of a spade, as this renders shovelling easier. Shield-shaped Shovels are best for shifting stones, and those made entirely of iron are most serviceable for stoking.

Spade. The Spade and its value as a garden tool are matters familiar to everyone; it would be impracticable to prepare ground for successional crops without it, as there is nothing which could form an efficient substitute. The two points in a Spade that it is most important should be strong are the back of the part which lifts the soil and the handle just where the first rivet passes through from the capped end. At one of these places Spades will sometimes either bend or break, if they are of inferior make, before they have been used many days. These points should, therefore, be examined by purchasers: it causes great hindrance and loss to have new handles put in—work which is rarely very well done a second time over; and if the back breaks, there is no chance of remedying it. Spades are sometimes broken by improper usage, such as wrenching anything too heavy: this is, of course, a fault on the part of the workmen using them.

Syringes. A Syringe is especially required in glass structures for dewing or washing fruit-trees and plants in general at some part of their season of growth. It requires careful handling, and the barrel should not be knocked against any hard surface, which would cause indentations, and prevent the piston from working properly inside. The best Syringes are usually provided with two, or even three, movable roses of different kinds, any one of which may be used according to the force of water required. The kind most generally useful is that with a nozzle in which a ball is placed. When the piston-rod is drawn, the ball allows water to pass in, but it must be expelled through a small tube placed alongside, as the ball fits and closes the nozzle when pressed from behind with water and the piston. By practice, a workman

Tools, Implements, &c.—*continued.*

may spread the water with his finger, and direct its course at will to any position or part of the house. If this cannot be done readily, another perforated rose may be screwed on instead, which will separate the particles of water as they pass through it.

Trowel. Garden Trowels are indispensable for lifting and replanting such things as carry a ball of earth with their roots. For bedding-out in May and June, Trowels are in constant demand, and at all seasons use is generally found for them.

Turfing-iron and Turf-beetle. The first-named is an implement with a somewhat heart-shaped blade, and a bent

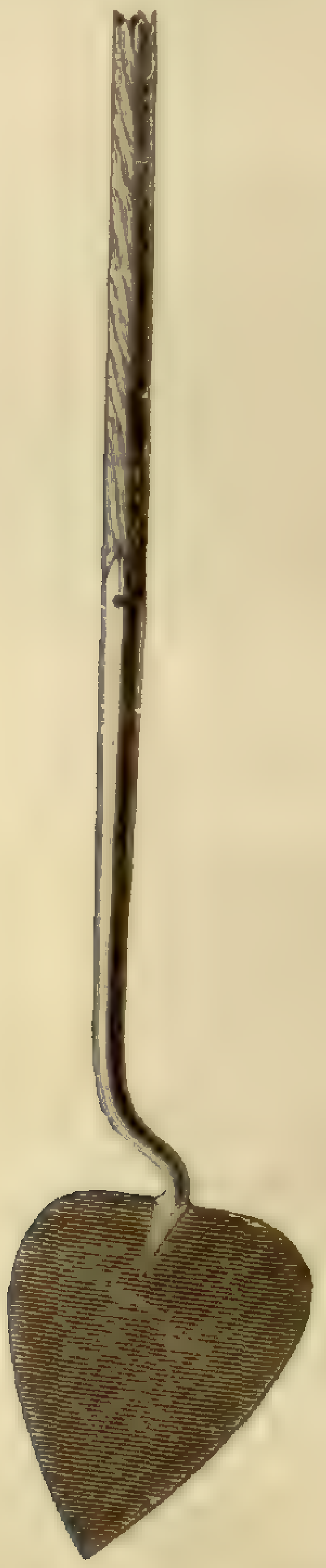

FIG. 59. TURFING-IRON.

handle (see Fig. 59). It is used for lifting turf that has previously been marked out and cut through with an edging-iron. The Turf-beetle consists of a flat piece of wood, about 3in. thick, with a handle attached at an acute

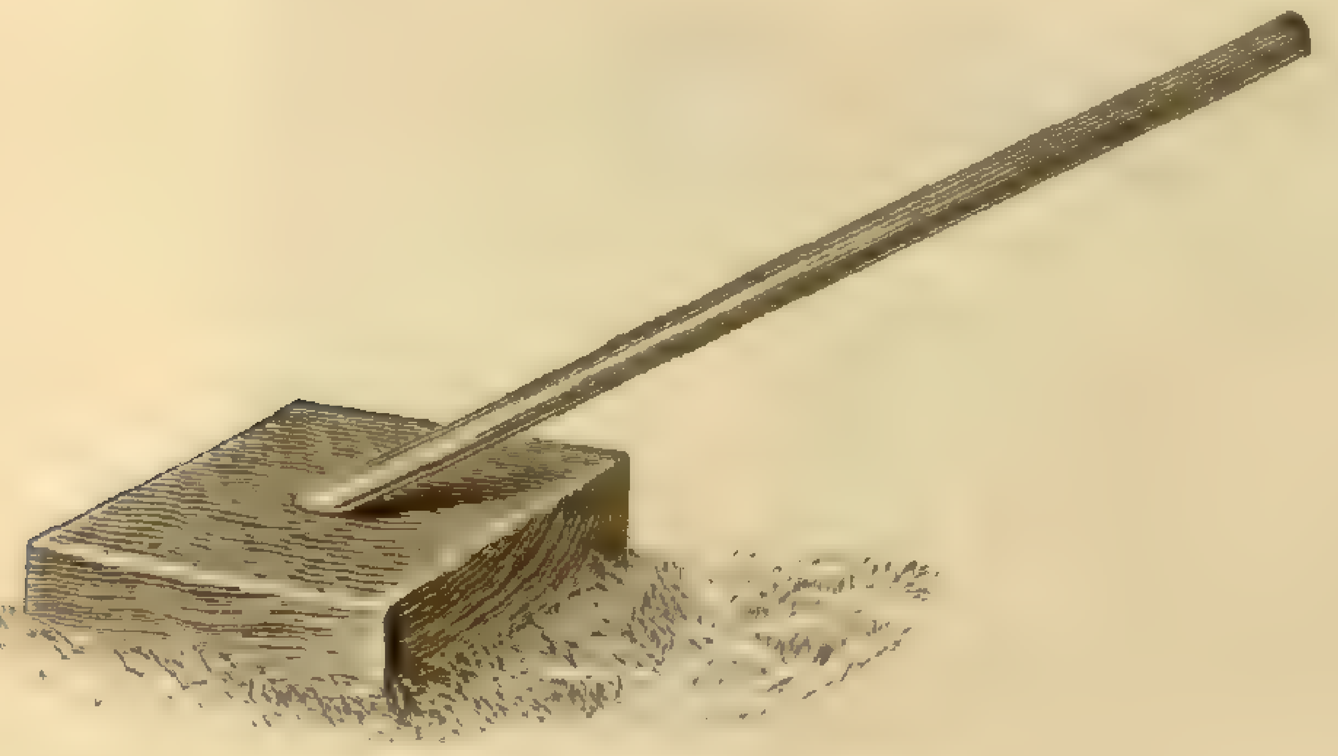

FIG. 60. TURF-BEETLE.

angle (see Fig. 60), to allow of the implement falling flat when lifted and brought down on to the turf. It is used principally for levelling newly-laid turf.

TOOL-SHED. A Tool-shed should be found in every garden. It should be provided with pegs, made of either wood or iron, and fixed near the ceiling, for hanging up Dutch hoes, rakes, scythes, and any other tools with long handles. Other pegs may be situated lower down for forks, shovels, spades, &c. A cupboard or chest should contain all small tools and implements, such as hammers, shears, trowels, &c. Every workman should help to keep the Tool-shed tidy, and the tools in good order, by cleaning everything he uses when any work is finished during the daytime, and returning it to its proper place, and also doing the same every evening when the hour for suspending work arrives.

TOONA. Included under *Cedrela.*

TOOTHACHE-TREE. *See* **Xanthoxylum fraxineum.**

TOOTHBRUSH-TREE. A common name for **Salvadora persica** (which *see*).

TOOTHED. *Having any kind of small divisions.*

TOOTHLETED. Furnished with little teeth.

TOOTHWORT. *See* **Dentaria** and **Plumbago scandens.**

TOPIARY WORK. Although the absurd fashion of cutting and torturing trees into all sorts of fantastic shapes has, happily, almost passed away, yet, as the art of the Topiarist was for a considerable period regarded as the perfection of gardening, some mention of it is desirable here. When the fashion first became popular in Britain, it is probably impossible to ascertain; but it reached its highest point in the sixteenth century, and held its ground until driven out of the field, in the last century, by the natural or picturesque style. From an archæological point of view, it is not to be regretted that examples of Topiary Work on a large scale still exist in several British gardens. Fig. 61 (for which we are indebted to Messrs. Veitch and Sons) represents a view at Elvaston Castle, near Derby. "A large portion of this consists of ornamental hedges of the common Yew, either dividing parts of the grounds from each other, or inclosing spaces devoted to special subjects; and of single specimens, both of the common Yew and its golden variety, cut into conical pyramids of uniform size and height; and of such as these there are upwards of one thousand. There are comparatively few representations of birds and animals; the bolder work represents the walls and bastions of a Norman castle, archways, alcoves, arbours, &c. The great extent of the Topiary Work at Elvaston is calculated to excite surprise rather than admiration; at the same time, its extreme formality is greatly relieved by the noble Conifers of the Fir and Pine tribe which have been planted beside and around it with no sparing hand, and by the beautiful view of the river Derwent, in its winding course through the grounds" (Veitch, "Manual of the Coniferæ").

Levens Hall, in Westmoreland, is a still more famous Topiarian garden than Elvaston. For an account of this, and an illustration, see vol. xxvi. of the "Archæological Journal." Two illustrations of some of the most remarkable groups in this same garden appeared in the "Gardeners' Chronicle" for 1874, vol. ii., p. 264. Here may be seen figures of the British Lion; of Queen Elizabeth and her ladies; of the Judge's Wig, a number of Yews planted in a half-circle, so as to form an arbour, by bringing the branches over the top in a hood or wig-like fashion; and many others. The astonishing tenacity of life possessed by the Yew is thoroughly proved by the fact that, as the figures (at Levens) above mentioned were first formed early in the eighteenth century, the bulk of the young growths must have been cut off for upwards of one hundred and eighty years, in order to keep the requisite size and form of the objects represented.

Topiary Work—*continued.*

The vast amount of not unskilled labour requisite to maintain in order any elaborate Topiarian designs will, no doubt—apart from any question of taste—prevent a recurrence of such practices to any appreciable extent. Evergreens were almost exclusively used, and of these, the Box, Yew, and Holly were those which lent themselves most readily to the Topiarist's skill. For columns and other more or less simple figures, the ordinary principle which now rules the clipping of a Yew hedge was sufficient. The branches were checked where too strong, and allowed to develop when not so vigorous, until the requisite size and shape were obtained, after which repeated clippings were necessary, beginning as soon as the young growths appeared in spring. For

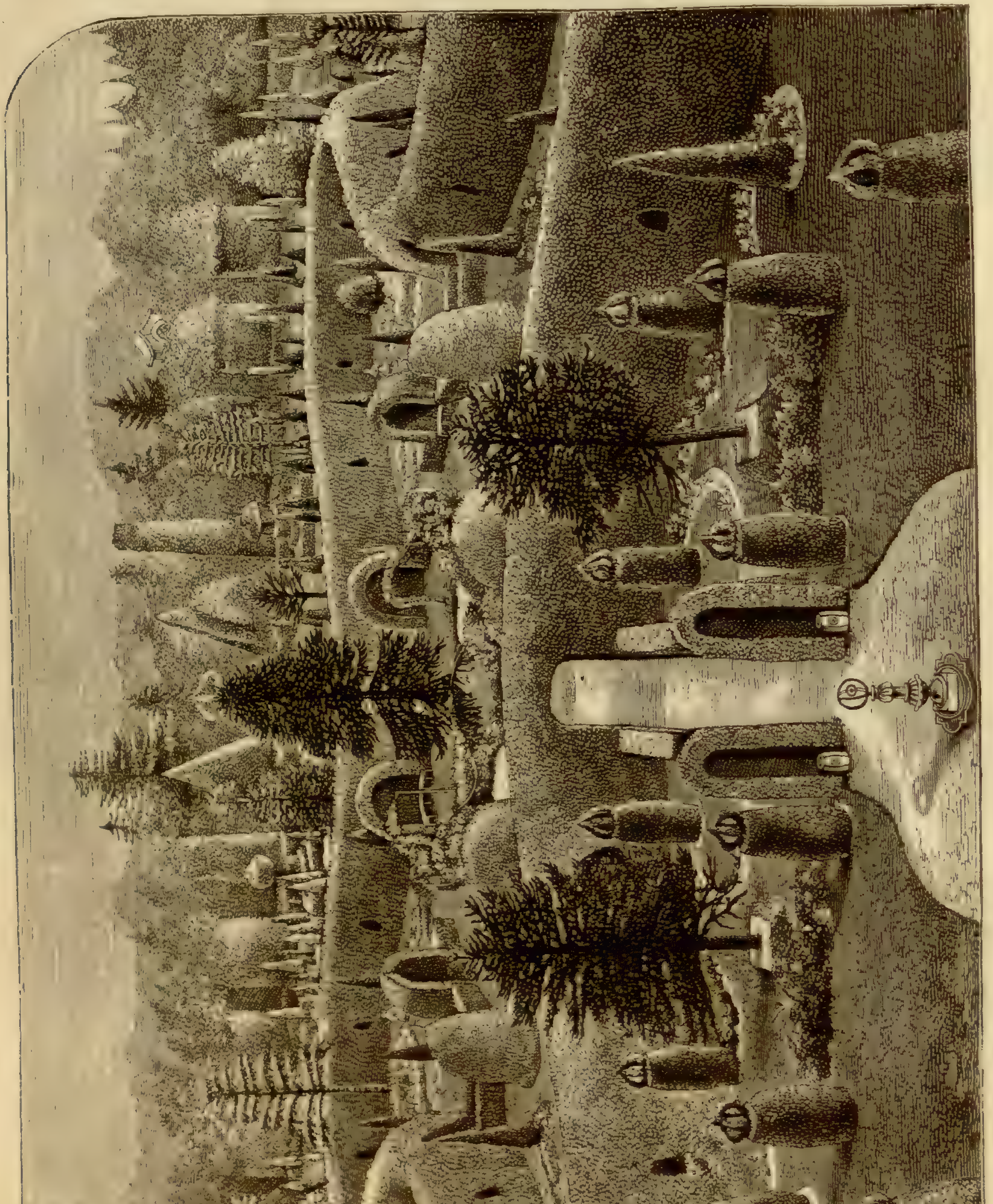

FIG. 61. TOPIARY WORK—THE YEW GARDEN AT ELVASTON CASTLE.

(From Veitch's "Manual of the Coniferæ.")

Topiary Work—*continued.*

elaborate figures, a number of plants might be used, and the leading branches of these might be united by "approach-grafting," until a regularly compact network of interlacing branches were securely growing together. By this means, less damage would be likely to occur through heavy falls of snow, or from violent gales. In one of the continental gardens, a few years ago, there were several young plants of the common Ash, grown so as to form, amongst other things, a more or less perfect crown, simply, as the label stated, to show what the skill of the grafter could accomplish. Some half-dozen tall young plants were placed in a circle: one of these was grafted, at some 6ft. from the ground, by approach to the other five, so as to present the appearance of a ring horizontally supported by half-a-dozen stems; from this ring were allowed to develop a series of branches, which were curved over and united into one stem by grafting. After this the branches again divided, and were made to assume other unnatural forms.

Constant attention is required in pruning and disbudding all such strong-growing plants as the Ash, and distorted and unsightly branches and stems are sure to be the result in a comparatively short time.

TOP-SHAPED. Inversely conical, with a contraction towards the point.

TORCH LILY. A common name for **Kniphofia** (which *see*).

TORCH THISTLE. An early name given to various species of **Cereus** (which *see*).

TORDYLIUM (the old Greek name used by Dioscorides). Hartwort. ORD. *Umbelliferæ*. A genus comprising about a dozen species of hardy, annual herbs, natives of Europe, North Africa, and temperate and Central Asia. Flowers white or purplish, in compound, many-rayed umbels. Leaves undivided or pinnate. The species possess no beauty.

TORENIA (name commemorative of Olef Toren, a Swedish clergyman, who discovered *T. asiatica* and other plants in China; he died in 1753.) SYNS. *Nortenia*, *Pentsteria*. ORD. *Scrophularineæ*. A genus embracing about sixteen species of stove, glabrous, pubescent, or hairy, perennial herbs (in all probability, annual in a wild state), natives of tropical and Eastern extra-tropical Asia and tropical Africa; one is also found in South America, where it was probably introduced. Calyx tubular, plicate or three to five-winged, obliquely three to five-toothed or bilabiate at apex; corolla tube cylindrical or enlarged above, the upper lip broad, emarginate or bifid, the lower one spreading, of three broad, subequal lobes; stamens four, perfect; pedicels ebracteolate; racemes short, few-flowered, fascicle-like, or rarely elongated. Leaves opposite, entire, crenated or serrated. The species known to cultivation are described below. They are of easy culture, and are admirably adapted for hanging baskets as well as for pot culture. The annuals may be raised from seed, sown in March or April, and placed in a warm temperature. When large enough to handle, the seedlings should be pricked off into the pots or baskets in which they are intended to flower. Torenias may also be readily propagated by cuttings: any young shoots will root in a close frame, or under a hand glass in a warm house. A compost of loam and leaf mould, with a little sand or charcoal intermixed, is most suitable. *T. Fournieri*, which grows erect, is best adapted for pot culture: its branches, which do not trail, need the support of a few small stakes. Green Fly are often troublesome to these plants when young. As a preventive, fumigate occasionally.

T. asiatica (Asiatic).* *fl.* on axillary and sub-umbellate pedicels; calyx 1in. long, scarcely winged; corolla blue, 1½in. to 1¾in. long, with very dark violet lateral lobes. June. *l.* shortly petiolate,

Torenia—*continued.*

ovate-cordate or ovate-lanceolate, serrated, 1½in. to 2in. long. Branches 6in. to 10in. long, slender, diffuse. India, &c., 1845. (B. M. 4249; F. d. S. x. 5, xiii. 1342; I. H. 199.)

T. a. hirsuta (hairy). *fl.*, lower filaments having a very small tooth. Plant more pubescent than the type. (B. M. 5167, under name of *T. hirsuta*.)

T. auriculæfolia (Auricula-leaved). *fl.* numerous, growing separately on slender scapes; corolla lobes pale lilac, blotched with purple and veined with white on the disk. Summer. *l.* radical, sessile, ovate. India, 1871. This plant has much the habit of a *Pinguicula*. (F. M. 534.) Its proper name is *Craterostigma pumilum*.

T. Bailloni (Baillon's). A synonym of *T. flava*.

T. concolor (one-coloured). *fl.* large, on axillary peduncles longer than the leaves; corolla concolorous, violet-blue. Summer. *l.* stalked, ovate-cordate, acute, serrate. *h.* 6in. to 12in. China, 1844. A glabrous or sparingly-pubescent herb, with diffuse, elongated branches. (B. M. 6797; B. R. 62.)

T. cordifolia (cordate-leaved). *fl.* axillary and sub-umbellate; corolla pale blue, ¾in. long; pedicels often longer than the leaves. July. *l.* petiolate, ovate, serrated, 1in. to 1½in. long, cuneate or very rarely cordate at base; petioles rarely as long as the blade. *h.* 4in. to 8in. India, &c., 1811. A sub-erect, sparsely hairy annual. (B. M. 3715.)

T. edentula (toothless). A synonym of *T. peduncularis*.

T. flava (yellow).* *fl.* axillary and in distant pairs; corolla yellow, ½in. to ¾in. long, with a purple eye; pedicels usually shorter than the calyx. Summer. *l.* sessile or petiolate, ovate or oblong-ovate, obtuse, entire or crenated. *h.* 6in. to 10in. India, &c., 1878. Erect or decumbent, sparsely hairy or glabrous. (B. M. 6700.) SYN. *T. Bailloni* (B. H. xxix. i., fig. 2; I. H. xxv. 324; R. H. 1879, 15).

T. Fordii (Ford's). *fl.* on short, sub-terminal, axillary peduncles; calyx with almost triangular teeth; corolla small, with an exserted tube, the limb straw-coloured with the lateral lobes blotched with violet. Summer. *l.* shortly-stalked, broadly ovate-rotundate or cordate. *h.* 6in. to 12in. An erect, pubescent herb. China. (B. M. 1797.)

T. Fournieri (Fournier's).* *fl.*, calyx ¾in. long, broadly five-winged; corolla tube pale violet, yellow at back, 1in. long; limb 1½in. in diameter, the upper lip pale lilac, obscurely two-lobed, the lower one of three much smaller, bright violet, rounded lobes, the central one with a golden blotch at base; racemes terminal, erect. Summer. *l.* 1½in. to 2in. long, ovate or ovate-cordate, acute, serrated, bright green. Branches crowded, erect from the root, 4in. to 8in. high, much-branched. Cochin China, 1876. Plant highly glabrous. (B. H. 1879, 1; B. M. 6747; Gn., Dec. 1877; I. H. n. s. 249; R. G. 927; R. H. 1876, 466.)

T. hirsuta (hairy). A variety of *T. asiatica*.

T. peduncularis (pedunculate-flowered). *fl.* usually pale blue, with yellow spots, midway between those of *T. asiatica* and *T. cordifolia*, but the filaments are not toothed, as in those species. June. *l.* petiolate, ovate, crenate-serrated. *h.* 6in. India, Philippines, &c., 1845. Decumbent or sub-erect, glabrous or softly hairy. SYN. *T. edentula* (B. M. 4229).

TORFACEOUS. Growing in bogs or mosses.

TORINGO CRAB. *See* **Pyrus Toringo.**

TORMENTILLA. Included under **Potentilla** (which *see*).

TORMENTIL-ROOT. A common name for **Potentilla Tormentilla** (which *see*).

TORNELIA. A synonym of **Monstera** (which *see*).

TOROSE. A cylindrical body, irregularly swollen.

TORRESIA. A synonym of **Hierochloë** (which *see*).

TORREYA (named in compliment to Dr. John Torrey, 1796-1873, an American botanist, and one of the authors of the "Flora of North America"). Stinking Yew. SYNS. *Caryotaxus*, *Fœtataxus*. ORD. *Coniferæ*. A genus embracing only four species of hardy, evergreen trees, emitting a strong, disagreeable odour from all parts when bruised, natives of North America, North China, and Japan. Flowers diœcious, the males solitary and sub-sessile in the axils, the female catkins axillary, sessile, one-flowered. Fruit ovoid, drupe-like, ¾in. to 1½in. long. Leaves sub-spirally affixed, distichously spreading, very shortly petiolate, linear, flat, similar to those of *Taxus*, but longer. The species do not attain in Great Britain anything near the beautiful aspect they assume in their

Torreya—*continued.*

native countries. Torreyas thrive in almost any soil They are readily propagated from seeds, which should be sown in spring; the ripe fruits, after being gathered, should be mixed with sand, and treated similarly to those of the Hawthorn, until sowing time. Cuttings also afford a ready means of increasing the stock of any species;

Torreya—*continued.*

T. grandis (great).* *fr.* green, the size of a small walnut. *l.* very rigid, linear-lanceolate, rather short, somewhat falcate, ¾in. to 1in. long, light glossy-green above, much paler, with two narrow, greyish lines beneath, on very short, spirally-twisted footstalks, more or less opposite, spiny-pointed. Branches whorled, horizontally spreading; branchlets laterally distichous. *h.* 60ft. to 80ft. China. See Fig. 63. (G. C. n. s., xxii., p. 681; R. H. 1879, 173.) SYN. *Cephalotaxus umbraculifera.*

FIG. 62. BRANCH, WITH ONE MATURE AND TWO YOUNG FRUITS, OF TORREYA CALIFORNICA.

these should be inserted in sandy soil, in August, and kept shaded under handlights, or in cold frames, during bright sun, until rooted. Layering may also be advantageously resorted to.

T. californica (Californian). Californian Nutmeg. *fr.* with a leathery-green covering. *l.* long, narrow, and opposite on the

T. myristica (nutmeg-shape-fruited). A synonym of *T. californica.*

T. nucifera (nut-bearing). *fr.* ¾in. long, ½in. broad, oval or ovate-oblong, glossy. *l.* linear, rounded at base, quite straight, flat, leathery, spiny-pointed, mostly curved downwards, 1in. to 1¼in. long, on very short footstalks, deep glossy-green, glaucous-white beneath. Branches numerous whorled, alternate, or scattered

FIG. 63. BRANCH, WITH IMMATURE ABNORMAL FRUITS, OF TORREYA GRANDIS.

branchlets, but somewhat alternate and scattered round the principal shoots, linear-lanceolate, spiny-pointed, shortly petiolate, decurrent at base, 2in. to 2½in. long, pale yellowish-green. *h.* 20ft. to 40ft. California, 1851. See Fig. 62. (B. M. 4780; F. d. S. 925; G. C. n. s., xxii., p. 681, under name of *T. myristica.*)

along the stem, horizontally spreading. *h.* 20ft. to 30ft. Japan. See Fig. 64. (R. H. 1873, 315; S. Z. F. J. 129.)

T. taxifolia (Yew-leaved).* Stinking Cedar. *fr.* oval, a little pointed, nearly as large as a walnut. *l.* rounded at base, and somewhat recurved at the extremity, linear, frequently falcate,

Torreya—*continued.*

FIG. 64. BRANCH, WITH MALE FLOWERS, AND DETACHED CLUSTER OF MALE FLOWERS, OF TORREYA NUCIFERA.

stiff, leathery, on very short footstalks, twisted and decurrent at base, spiny-pointed at apex, 1in. to 1⅜in. long, glossy and convex above, beneath pale glaucous-grey, and marked on each side the

FIG. 65. BRANCHLET AND FRUIT OF TORREYA TAXIFOLIA.

midrib with two narrow, reddish, sunken bands. Branches mostly whorled, spreading; branchlets horizontal. *h.* 40ft. to 50ft. Florida, 1840. See Fig. 65. (G. C. n. s., iv. 291.)

TORRUBIA (named by Leveille, in honour of a Spanish writer on "Vegetable Wasps," as wasps attacked by the plants of this genus [see below] were formerly called). A genus of Fungi, of which by far the larger number are parasitic in insects, spiders, and their allies; while a small number live on other Fungi. *Torrubia* is the name by which the genus is generally known; but it must give place to the name *Cordyceps*, previously conferred by the eminent Swedish mycologist, Elias Fries.

The genus belongs to the group of compound **Pyrenomycetes** (which *see*); but is peculiar in the substances on which the various species live, and also in the erect, clubbed, fleshy mass of mycelium (called a *stroma*), the appearance of which is shown in Fig. 66. On, or embedded in, it are the flask-shaped perithecia, inclosing the asci. In each of the latter are eight thread-like spores, which usually soon break into joints. These joints are capable of giving origin to the cycle again, if they fall on a suitable stratum, *e.g.*, the body of an insect. But they produce not the Pyrenomycetous fungus, but a smaller vertical stroma, branched or simple, composed of a bundle of mycelium threads, which bear numerous round or elliptical, pale, minute conidia, or spores. This stage of these Fungi was formerly regarded as belonging

Torrubia—*continued.*

to a distinct group (*Hyphomycetes*), without asci, and the various forms were grouped together under a new generic name—*Isaria*. This genus resembles *Cordyceps* in having an erect, club-shaped stroma; but, instead of inclosing perithecia with asci, the filaments of the mycelium end in free tips, each of which bears small, oval or globular, pale conidia, capable of reproducing either *Isaria* or *Cordyceps*. For convenience, the genus *Isaria* is still kept up, as the perfect or mature forms of a large number of the Fungi placed in it have not yet been recognised, and to attempt to dispense with the group would, at present, only cause confusion and

FIG. 66. CORDYCEPS SINENSIS, GROWING ON THE LARVA OF A MOTH—*a*, Stroma of the Fungus, divided at the tip into three branches; *b*, the Larva, from which the Fungus has grown out.

uncertainty. Moreover, there is reason to believe that several of the forms referred to *Isaria* do not belong to *Cordyceps*, but should be referred to other genera; inasmuch as they live on a wider range of materials, and some injure *living* plants also (*e.g.*, *Isaria fuciformis* destroys grasses in Australia and in the South of England), while *Cordyceps* is not known as a parasite on living plants. Most of the species in the latter genus abound in tropical countries; but several have been found in Britain, in all their stages of development, on dead insects. Among the best-known of these are *C. entomorrhiza* and *C. militaris*: these form slender stalks 1in. to 2in. in height, the clubbed heads on which are ovoid or globose. On tracing the stalks downwards, they are found to rise from the bodies of larvæ or pupæ, buried in the soil or among dead leaves. These Fungi may be regarded as beneficial to gardeners, inasmuch as they destroy insects, many of which feed on garden produce. They are not often met with, however, and can

Torrubia—*continued.*

scarcely be regarded as of much importance from this point of view. On the other hand, no species of *Cordyceps* is known to be injurious in gardens. Probably, the species most widely known, by its popular name at least, is the so-called "Vegetable Caterpillar," often sent from New Zealand. This reaches a height of from 6in. to 8in., the club being from 3in. to 4in. long, and ⅓in. thick. It grows out of the body of some large larva (usually that of an insect allied to the Otter Moth or Ghost Swift), and is often erroneously supposed by the finders to be a caterpillar in course of development into a Fungus. This Fungus is *C. Hugelii*, Corda; though more generally referred to in English works by the name *C. Robertsii*, given to it, by the Rev. M. J. Berkeley, at a later date than Corda's. Mr. Berkeley has described a still larger species from Australia, under the name *Sphæria Taylori.*

TORRUBIA (of Vellozo). A synonym of **Pisonia** (which *see*).

TORTOISE-PLANT. *See* **Testudinaria elephantipes.**

TORTRICINA (from *torqueo*, to twist). A group of Moths, popularly known as Leaf-rollers, because of the habit exhibited by the larvæ of many species of rolling up the leaves of their food-plants into tubes, in which they shelter themselves from birds and other foes. Inside the tubes the larvæ live and feed in safety; but when the food-plant is shaken, each larva drops from its tube, and hangs suspended by a silken thread. When the danger is past, the larva climbs up the thread, and regains the shelter of the tube. Many larvæ become pupæ in the tubes. Some species live in roots or twigs (*see* **Retinia**), or in unripe fruits (*see* **Apple or Codlin Grub**). The *Tortricina* are all of small size, scarcely any of the moths reaching 1in. in spread of wings. The body is slender, but the wings are comparatively broad, and when at rest they slope like the roof of a house above the body. In many, the costa, or front margin, of the wings is peculiarly curved; so that the insect at rest is not unlike a bell in outline when seen from above. The front wings are, in most of the species, rather uniformly coloured; usually being some shade of brown, with darker markings, or bands and spots. Some show metallic spots; and others have the wings variegated with black and white, while others have them some uniform shade of green. The palpi, or feelers attached to the mouth-pieces, are short and inconspicuous. The larvæ have never less than sixteen prolegs, or sucking feet, on the hinder rings of the body.

A good many species of this group are injurious to cultivated plants, often by eating the leaves; *e.g.*, *Tortrix viridana* sometimes strips Oak-trees bare. Roses are also much damaged by several species that live in the rolled leaflets, or inside the leaf-buds and flower-buds. Most fruit-trees are more or less liable to similar injuries; and the *Coniferæ* often have the twigs pierced up the centre by the larvæ. Herbaceous plants, though occasionally attacked, are far less often seriously damaged than woody plants or shrubs.

Remedies. These vary according to the nature of the injury done. Larvæ in tubes are best got rid of by beating the branches well over sheets, or over vessels tarred inside to prevent the escape of the larvæ. The insects shaken off should be destroyed. Such as live in twigs are more difficult to dislodge; but sickly twigs should be cut off and burned. Fruits tenanted by larvæ usually fall prematurely, and such windfalls should, without delay, be collected from the ground, and destroyed, or given to pigs, as the larvæ very soon bore out of the fruits, and pass into the soil, there to remain all winter as pupæ. Further information is given under **Moths, Oak** (INSECT PESTS), and **Tortrix.**

TORTRIX (from *torqueo*, to twist; in allusion to the leaves of plants being twisted or rolled by the larvæ, to form tubes in which they live). The leading genus of the group of small Moths known as the *Tortricina*. The genera in this group are distinguished from one another by very slight characters, so that it is difficult for any one but a specialist to be sure of the genera and species. *Tortrix* is closely related to several other genera, and its extent is somewhat uncertain; some specialists forming several genera from an assemblage of species that others consider ought to be retained in one genus. In the genus, even when most restricted, there are several species hurtful to garden produce and to cultivated trees. Of these the most destructive is *T. viridana.* This insect has the fore wings pale green, with their front margin sulphur-yellow; they extend from ⅔in. to 1in. in span. The larvæ live in tubes formed by rolling up leaves of almost all kinds of trees, and of some shrubs; but they are peculiarly destructive to Oaks, which they occasionally strip absolutely bare. *T. icterana* has pale-ochreous wings, and is about the same size as *T. viridana.* Its larvæ feed mostly in rolled leaves of herbs, and may be looked on as almost harmless, as they usually feed on weeds. *T. heparana* and *T. ribeana* are both brown, with darker markings. The larvæ of both feed on the leaves of various trees, and are at times hurtful to fruit-trees. *T.* (*Œnectra*) *Pilleriana*, though very rare in Britain, is, in some seasons, very destructive to Vines in France, and elsewhere on the Continent, stripping off the leaves. The larvæ have been observed passing the winter sheltered under loose bark, emerging in spring to feed on the buds and young leaves. The fore wings of this Moth have a spread of only about ⅔in.; they are pale ochreous, with a brown patch near the base, and a brown cross-bar in the middle. The other British species of the genus are not sufficiently hurtful to call for special mention.

Remedies. These are given under **Tortricina.**

TORTULA (of Roxburgh). A synonym of **Priva** (which *see*).

TORTUOUS. Having an irregular, bending, and turning direction.

TORULOSE. Slightly torose.

TORUS. The same as **Thalamus** (which *see*).

TOTARA PINE. *See* **Podocarpus Totara.**

TOUCH-ME-NOT. *See* **Impatiens noli-me-tangere.**

TOURNEFORTIA (named in memory of Joseph Pitton de Tournefort, 1656-1708, the distinguished author of an arrangement of plants under the title of "Institutiones Rei Herbariæ"). Including *Messerschmidia.* ORD. *Boragineæ.* A large genus (nearly 100 species) of stove, greenhouse, or hardy trees or shrubs, sometimes sarmentose or twining, very rarely sub-shrubs, broadly dispersed over the warmer regions of the globe. Flowers rather small, cymose; calyx five-parted; corolla with a cylindrical tube and five imbricated or induplicate lobes; stamens five, affixed to the tube, included. Leaves alternate, entire. The species have little or no horticultural merit. Only two call for mention here: both thrive in any fairly good soil. Propagation may be effected by cuttings, inserted in sand, under a glass, with heat in the case of *T. heliotropioides*, which is the prettiest plant of the genus.

T. fruticosa (shrubby). *fl.* sweet-scented; corolla yellow, salver-shaped, the tube much longer than the calyx; cymes terminal, loosely trichotomous-corymbose. June. *l.* petiolate, lanceolate or elongated ovate-lanceolate, acuminate, rather obtuse at base, 3in. long. *h.* 4ft. Canaries, 1800. Greenhouse shrub. (B. R. 464.)

T. heliotropioides (Heliotrope-like). Summer Heliotrope. *fl.* the colour and shape of those of the common Heliotrope (*H. peruvianum*), but devoid of scent. May. *l.* elliptic, obtuse, pubescent on both sides, the margins undulated. Branches terete, and, as well as the petioles, hairy. *h.* 2ft. Buenos Ayres, 1829. Stove sub-shrub. (B. M. 3096.)

TOURRETIA (named in honour of Marc Antoine Louis Claret de la Tourrette, 1729-1793, a friend of Rousseau, and author of several botanical works). SYNS. *Dombeya*, *Medicn.* ORD. *Bignoniaceæ*. A monotypic genus. The species is a hardy, climbing herb (or sub-shrub?), usually treated in gardens as an annual. Seeds should be sown, early in spring, on a hotbed. When the young plants are strong enough to handle, they may be planted in light soil, against a wall or pillar.

T. lappacea (Bur-like). *fl.* in long, spicate racemes, on terminal peduncles; calyx two-parted, deciduous; corolla purple-violet, with a very unequally bilabiate limb; stamens four, didynamous. July. *l.* opposite, di- or trichotomously divided; segments petiolulate, membranous, serrated; petioles produced into a branched tendril or leaflet. Branches slender, tetragonal. *h.* 6ft. Mountains of tropical America, 1788. (B. M. 3749.)

TOVARIA. A synonym of **Smilacina** (which *see*).

TOVOMITA (from *Tovomite*, the Caribbean name of *T. guianense*). SYNS. *Beauharnoisia*, *Marialva*, and *Micranthera*. ORD. *Guttiferæ*. A genus comprising about a score species of tropical American, stove trees or shrubs, with resinous juice. Flowers often rather small, cymose-umbellate or in dense panicles; sepals two or four; petals four to ten, imbricated, often twin-seriate; stamens indefinite. Fruit often obovoid-oblong or pyriform. Leaves penninerved. The three species introduced are handsome trees, thriving in a mixture of loam, peat, and sand. Ripened cuttings will root freely in sand, under a hand glass, in heat.

T. Choisyana (Choisy's). *fl.* yellow; sepals four, the two inner ones petaloid; petals eight to eleven; pedicels shorter than the flowers; male cymes terminal, few-flowered. May. *l.* oblong, acute at base, shortly and rather obtusely acuminate at apex, entire. *h.* 20ft. Cayenne, 1823. SYN. *Micranthera clusiæfolia*.

T. fructipendula (pendulous-fruited). *fl.* yellowish, on jointed pedicels; sepals two; petals four; peduncles filiform, axillary and terminal, two or three-flowered, elongated. January and February. *fr.* turbinate, pendulous, crowned by the permanent styles. *l.* oblong, acutely and sharply acuminate, 3in. long. *h.* 18ft. Peru. SYN. *Beauharnoisia fructipendula*.

T. guyanensis (Guiana). *fl.* diœcious; sepals two; petals four, green; anthers white; pedicels jointed; peduncles corymbose, dichotomous, thick, terminal. June. *l.* ovate-oblong, bluntly acuminate, somewhat stem-clasping, coriaceous, 4in. to 5in. long, white beneath. *h.* 10ft. Guiana and Brazil, 1827. (A. G. 364.) SYN. *Marialva guyanensis*.

TOWN CRESS. A common name for **Lepidium sativum** (which *see*).

TOXICODENDRON (from *toxicon*, poison, and *dendron*, a tree; alluding to the poisonous nature of the fruits). SYN. *Hyænachne*. ORD. *Euphorbiaceæ*. A small genus (two species) of small, rigid, much-branched, greenhouse trees, endemic in South Africa. Flowers diœcious, apetalous, axillary, the males densely cymulose and shortly pedunculate, or loosely racemose, the females solitary, shortly pedicellate. Capsule sub-globose, thick, hard. Leaves opposite or often whorled, entire, rigidly coriaceous. *T. capense*, the only species introduced, succeeds in well-drained, sandy loam. When at rest, water should be sparingly given. Propagation may be effected by cuttings, inserted in sandy soil, under a bell glass.

T. capense (Cape of Good Hope). *fl.*, male panicle about one-third the length of the leaves, slightly puberulous, cluster-flowered; bracts thick, ovate-lanceolate. June. *l.* sub-lanceolate, linear, narrowly oblong, or elliptic, cuneate-narrowed at base, rounded and obtuse at apex, paler beneath, glabrous. Flowering branches terete. *h.* 5ft. to 6ft. 1783. SYN. *Hyænachne globosa*.

TOXICOPHLÆA (from *toxicon*, poison, and *phloros*, bark; in allusion to the poisonous rind). SYN. *Acokanthera*. ORD. *Apocynaceæ*. A small genus (three species) of very poisonous, tall, greenhouse shrubs or small trees; two are natives of South Africa, and the third is Abyssinian. Flowers white, or pink on the outside, odorous; calyx five-parted, eglandular; corolla salver-shaped, with a cylindrical tube and five twisted lobes; cymes sub-racemose, dense, sub-sessile in the axils. Berry globose, one or two-seeded. Leaves opposite, thickly coriaceous, obliquely penniveined.

Toxicophlæa—*continued.*

The two introduced species thrive in a light, rich soil, with an occasional watering of weak liquid manure. Cuttings root readily under a hand glass, in moderate heat.

T. cestroides (Cestrum-like). A synonym of *T. Thunbergii*.

T. spectabilis (showy).* Wintersweet. *fl.* white, in terminal and axillary corymbs, which form a very large, dense spray, frequently over 2ft. in length; perfume sweet and powerful. Spring. *l.* elliptic. *h.* 4ft. to 6ft. South Africa, 1872. (G. C. 1872, 363; Gn. July, 1877; R. H. 1879, 270.)

T. Thunbergii (Thunberg's). *fl.* yellowish, tipped with brown, expanding in the afternoon; corymbs sessile, axillary, usually eight-flowered. February to April. *l.* lanceolate-oblong, coriaceous. *h.* 6ft. to 7ft. Cape of Good Hope, 1787. The correct name of this plant is now *Acokanthera venenata*. (I. H. 1885, 543.) SYN. *T. cestroides* (R. G. 940; R. H. 1880, 370).

TOXOSTIGMA. A synonym of **Arnebia** (which *see*).

TRACHEA (derivation uncertain). A small genus of Night-moths (*Noctuæ*), of which only one species, *T. piniperda*, or the Pine Beauty Moth, is found in Britain. The

FIG. 67. TRACHEA PINIPERDA.

size, form, and markings of the moth are shown in Fig. 67. The front wings are brick-red, or reddish-brown, mixed with grey and pale orange; there are darker oblique cross-lines, and whitish spots towards the middle of each wing, the centre of the larger spot being filled up with orange-grey. The moths fly in the early spring. The larvæ are slender; when full-grown, they are yellowish-green, with a white line down the middle of the back, and a double line (white above, and orange beneath) along each side above the legs. The young larvæ are of a uniform green colour. They feed on the leaves of Fir-trees during summer, and, when full-fed, spin slight cocoons in crevices of the bark, or under the soil, and in them become brown pupæ.

Where these Moths are conspicuously hurtful to Conifers, their numbers may be reduced by shaking them off the branches, and preventing them from ascending the trunk by putting a ring of tar around it. The pupæ also should be sought for in the crevices of the bark, and by turning up the soil around the trunks to a depth of three or four inches. This insect is, however, seldom so abundant as to do much harm in any part of Britain.

TRACHEA, TRACHENCHYMA. Spiral vessels; air-tubes, containing a spiral thread of considerable toughness and elasticity.

TRACHELIUM (from *trachelos*, the neck; alluding to the supposed efficacy of the plants in diseases of the trachea). Throatwort. ORD. *Campanulaceæ*. A small genus (four or five species) of hardy, perennial herbs or sub-shrubs, natives of the Mediterranean region. Flowers sub-umbellate or in a corymbosely-branched panicle; calyx tube adnate, the limb five-parted; corolla narrow-tubular, shortly five-lobed at apex; stamens free. Leaves exstipulate. Only one species calls for mention here. It thrives in a compost of sandy loam and vegetable mould. Increased by seeds, sown on a slight hotbed, in spring; or by cuttings of young shoots, inserted in sandy soil, in April, or at the end of summer.

T. cæruleum (blue). *fl.* small, very numerous, corymbose; corolla violet-blue, salver-shaped, with a long and very narrow tube. August. *l.* ovate, acute, deeply serrated, on short petioles. Stem erect. *h.* 2ft. Italy and Spain, 1640. (B. R. 72.)

T. c. album (white). This only differs from the type in having white flowers.

TRACHELOSPERMUM (from *trachelos*, the neck, and *sperma*, a seed; alluding to the apical elongation of the seeds). SYNS. *Parechites*, *Rhynchospermum* (of Lindley). ORD. *Apocynaceæ*. A small genus (four species) of stove or greenhouse shrubs, inhabiting the East Indies, the Malayan Archipelago, and Eastern Asia, extending as far as Japan. Flowers white, in loose, terminal or pseudo-axillary cymes; calyx small, five-parted, with five to ten glandular scales at base within; corolla salver-shaped, with a cylindrical tube, a constricted throat, and five oblong, twisted lobes; filaments very short; disk annular, truncate or five-lobed. Leaves opposite, scattered, penniveined. *T. jasminoides* is a pretty, greenhouse climber, of easy culture in a compost of light loam and peat. It may be readily increased by cuttings.

T. jasminoides (Jasmine-like).* *fl.* white, very fragrant, several in a cyme; corolla tube contracted below the middle, hairy within at the mouth, the lobes waved, with reflexed margins; peduncles solitary, axillary or terminal, much longer than the leaves. July. *l.* on very short petioles, ovate-lanceolate, acute, the younger ones pale yellow-green. Shanghai, 1846. SYN. *Rhynchospermum jasminoides* (B. M. 4737; J. H. S. i., p. 74; L. & P. F. G. ii. 147).

T. j. angustifolium (narrow-leaved). A form with smaller, narrower leaves than the type; it proves hardy when grown against a wall in the open air in the south of England. SYN. *Rhynchospermum angustifolium*.

TRACHYCARPUS (from *trachys*, rough, and *karpos*, fruit; probably in allusion to the rough, hairy fruit). ORD. *Palmæ*. A small genus (four species) of greenhouse or half-hardy, unarmed Palms; two inhabit the mountains of North India and Burmah, the third is Chinese, and the fourth Japanese. Flowers yellowish, small; spathes many, rather large, compressed, obliquely cut, thickly coriaceous, tomentose; spadices many, short or elongated, robust, densely or loosely flowered. Fruit yellowish, small, globose, ellipsoid, or sub-reniform, one-seeded. Leaves terminal, orbicular or semi-orbicular, deeply plicate-multifid; segments narrow, induplicately bifid; rachis none; ligule very short; petioles biconvex; sheath entire. Caudices solitary and tall, or dwarf and tufted. The species are of very easy culture in a compost of rich, strong loam, to which is added a small portion of vegetable mould and sand. Perfect drainage, and copious supplies of water throughout the summer, are most essential to success. Propagation may be effected by suckers, which generally appear in considerable quantities; or by seeds.

FIG. 68. TRACHYCARPUS EXCELSUS, in a Young State.

T. excelsus (tall).* *fl.*, spadix 1ft. long, duplicately branched; spathes membranous, fuscous, tubular, bifid at apex. *l.* in young specimens oblong, in adults transversely oblong, concave, digitately multipartite, 1½ft. in diameter; segments fifteen to sixty, linear, somewhat obtuse, bidentate or shortly bifid, the teeth or segments obtuse; petioles above loosely concave, below convex, 1½ft. long, the margins smooth or armed with small teeth. *h.* 24ft. China and Japan, 1844. See Fig. 68. (F. d. S. 2368.) SYN. *Chamærops excelsa*.

T. Fortunei (Fortune's).* *fl.* yellow; inflorescence densely paniculate, more than 9in. long. *l.* semi-orbicular, flabellate, 1½ft. long and broad, cut half-way or more down; segments ¾in. to 1in. broad, pendulous towards their tips; petioles 1½ft. or more long, unarmed, or the margins very obscurely toothed. Caudex 8ft. to 12ft. high, the lower portion marked with the scars of fallen leaves. China, 1849. Hats, brooms, brushes, cordage, sandals, and whole dresses, are made, by the natives, of the fibrous sheaths of old leaves. (G. C. n. s., xxiv., p. 305.) SYN. *Chamærops Fortunei* (B. M. 5221).

T. khasyanus (Khasyan). *fl.*, spadix 2ft. long, the lower half concealed by the spathes, of which there are three; branches of the spadix exserted, quite naked. *l.* flabelliform, reniform, 2ft. long, 3½ft wide; segments about sixty-five, the lateral ones shortest, 12in. to 14in. long, but more deeply divided than the others, linear, their segments 2½in. to 3in. long, narrow, acute; petioles 1½ft. long, with irregular, denticulate margins. Trunk 5in. in diameter. *h.* 9ft. Khasya Mountains. SYN. *Chamærops khasyana*.

T. Martiana (Martius'). *fl.*, spadices many, in adults much-branched, spreading, many-flowered. *fr.* ovate, sub-solitary, lepidoted. *l.* palmately multifid; segments bifid at apex; sheath cylindrical, obliquely truncate. Caudex 26ft. high, cylindrical above, 4in. to 6in. in diameter, fusco-cinereous, marked with the scars of fallen leaves. Himalayas. SYN. *Chamærops Martiana*.

TRACHYMENE (from *trachys*, rough, and *hymen*, a membrane; alluding to the channels of the fruit). SYNS. *Didiscus*, *Huegelia*. ORD. *Umbelliferæ*. A genus comprising about fourteen species of stove or greenhouse, annual or perennial herbs; one inhabits New Caledonia, another Borneo, and the rest are endemic in Australia. Flowers white or blue, in simple umbels; calyx teeth minute or obsolete; petals entire, obtuse, imbricated; involucral bracts linear, often connate. Leaves ternately dissected or rarely undivided, toothed; stipules wanting. *T. cærulea*, the only species worth describing in this work, is a rather coarse, erect, more or less hirsute, greenhouse annual or biennial. It should be raised from seeds, sown on a gentle hotbed.

T. cærulea (blue). *fl.* usually blue; petals unequal; involucral bracts numerous, linear; peduncles long, each bearing an umbel of very numerous flowers, 1in. to 2in. in diameter. July. *l.* once or twice tripartite; lobes linear-cuneate, trifid or incised, acute; upper floral leaves small, simple or trifid. *h.* 1ft. to 2ft. West Australia, 1827. (B. R. 1225.) SYN. *Didiscus cæruleus* (B. M. 2875).

TRACHYMENE (of De Candolle). A synonym of **Siebera** (which *see*).

TRACHYNOTIA. A synonym of **Spartina** (which *see*).

TRACHYSTEMON (from *trachys*, rough, and *stemon*, a stamen; alluding to the villous filaments of one of the species). SYNS. *Nordmannia*, *Psilostemon*. ORD. *Boragineæ*. A genus including only a couple of species of hardy, erect, branched, hispid, perennial herbs, found in the Orient. Flowers pink or white, pedicellate; calyx five-cleft; corolla tube cylindrical, five-scaled within, the five lobes linear, spreading, or at length revolute; stamens five; cymes rather loose, bundle-flowered. Nutlets four, erect. Radical leaves often ample, long-petiolate; cauline ones few, alternate. *T. orientalis*, the only species calling for description here, thrives in ordinary soil; it may be multiplied by seeds, or by divisions.

T. orientalis (Eastern). *fl.* purplish-blue, copious, on long pedicels; corolla lobes revolute, pilose outside at the apex. March to May. *l.* hispid, broad; lower ones cordate; upper cauline ones ovate-lanceolate, narrowed at base. Stem hispid. *h.* 1ft. to 2ft. 1752. (G. C. n. s., xiv., p. 17.) SYN. *Borago orientalis* (B. R. 288; S. F. G. 175).

TRACHYTELLA. A synonym of **Delima** (which *see*).

TRADESCANTIA (named in honour of John Tradescant, gardener to Charles I.; he died in 1638). Spiderwort. SYN. *Ephemerum*. Including *Descantaria*, *Pyrrheima*. ORD. *Commelinaceæ*. A genus comprising about thirty-two species of stove, greenhouse, or hardy, perennial herbs, natives of North and tropical America. Flowers more or less pedicellate, numerous or few in a cyme, very rarely solitary; sepals distinct, concave, green or coloured; petals distinct, obovate or orbicular, sub-equal; stamens six,

Tradescantia—*continued.*

all usually perfect; cymes simple, variably disposed. Leaves variable. Stem simple or branched, diffuse, ascending, or erect. The best species are here described. They are amongst the easiest of plants to cultivate. Cuttings of the stove and greenhouse species root readily at almost any season, if inserted in light soil, in moderate heat. The hardy Tradescantias, of which *T. virginica* is one of the best, may readily be propagated by division; the plants succeed in ordinary garden soil.

T. caricifolia (Sedge-leaved). A synonym of *T. virginica.*

T. crassifolia (thick-leaved). *fl.* resembling those of *T. virginica;* sepals whitish, woolly; petals purplish-rose or blue; umbels three to six on a branch, sessile, axillary, the upper with two bracts, the lower with one. August. *l.* ellipsoid or narrow-lanceolate, woolly-villous beneath. Stem scarcely divided. Root a large tuber. *h.* 2ft. Mexico, 1796. Half-hardy. (B. M. 1598.)

T. c. acaulis (stemless). Stem shorter or scarcely any. (B. R. 1840, 34, under name of *T. iridescens.*)

T. c. glabrata (glabrous). *fl.*, sepals white-woolly. *l.* glabrous on both sides, the margins white-woolly. SYN. *T. speciosa.*

T. crassula (rather thick). *fl.*, sepals hairy-pilose; petals white; umbels many-flowered, loose, mostly terminal, rarely also one or two in the axils; pedicels glabrous. July. *l.* oblong, rather obtuse, 4in. long, glabrous, ciliated-pilose on the margins. Stem glabrous, sub-corymbosely branched. *h.* 1½ft. Brazil, 1825. Stove. (B. M. 2935; L. B. C. 1560.)

T. discolor (discoloured). A synonym of *Rhoeo discolor.*

T. elata (tall). A synonym of *T. virginica.*

T. erecta (erect). A synonym of *Tinantia fugax erecta.*

T. fuscata (fuscous). *fl.*, sepals rather thick, densely rusty-hairy outside; petals bluish-purple, round; peduncles axillary, crowded, one to three-flowered. September. *l.* 6in. to 8in. long, oblong, acute, scarcely acuminate, narrowed or attenuated at base, more or less petiolate. Stem short or scarcely any, clothed with dark sanguineous hairs. Brazil, 1820. Stove. (B. M. 2330; B. R. 482; L. B. C. 374.) SYN. *Pyrrheima Loddigesii* (of gardens).

T. glabra (smooth). A synonym of *T. virginica.*

T. iridescens (iridescent). A synonym of *T. crassifolia acaulis.*

T. latifolia (broad-leaved). A synonym of *Tinantia fugax erecta.*

T. multiflora (many-flowered). *fl.*, sepals ovate, hairy, equalling the white petals; umbels terminal and axillary; peduncles hairy, shorter than the leaves. June. *l.* ovate, sub-cordate-rounded at base, pointed, 1in. to 2in. long. Stem ascending. Jamaica, 1824. Stove. SYN. *T. procumbens.*

T. navicularis (boat-shaped). *fl.* similar to those of *T. virginica;* petals of a beautiful pink, twice the length of the navicular sepals; umbel terminal, solitary, many-flowered. Summer. *l.* ¾in. long, sessile, fleshy, navicular, ovate, acute, ciliated on the margins, very thickly dotted beneath. Stem stoloniferous at base, scarcely branched; floriferous branches geniculate-ascending. Peru. Stove. (R. G. 901.)

T. pilosa (pilose). A synonym of *T. virginica pilosa.*

T. procumbens (procumbent). A synonym of *T. multiflora.*

T. pulchella (pretty). *fl.*, sepals and pedicels nearly glabrous; petals rose-coloured or bluish. July. *l.* elliptic-lanceolate or lanceolate, sessile, 2in. long, acute, often rounded and somewhat stem-clasping at base, glabrous. Stem procumbent; branches sub-erect, glabrous. Mexico, 1825. Greenhouse.

T. rosea (rose-coloured). *fl.* ½in. in diameter; petals bright rose-coloured, three times as long as the ovate-lanceolate sepals; cymes solitary or in pairs, few-flowered; peduncles terminal, 3in. to 6in. long. June to August. *l.* linear-lanceolate, fringed on the margins. Stem simple, slender, smooth, 6in. to 8in. high. North Carolina, 1802. Hardy. (L. B. C. 370; S. B. F. G. 183.)

T. speciosa (showy). A synonym of *T. crassifolia glabrata.*

T. sub-aspera (rather rough). A synonym of *T. virginica.*

T. tumida (tumid). A synonym of *T. virginica tumida.*

T. undata (waving). A synonym of *Tinantia fugax erecta.*

T. velutina (velvety). *fl.*, sepals and pedicels softly pubescent; petals purplish-rose; umbels terminal and axillary, many-flowered. May. *l.* 5in. long, sessile, oblong-lanceolate, acute, densely and softly pilose above, very shortly silky-villous beneath. Stem branched, softly whitish-villous. *h.* 1½ft. Guatemala, 1850. Stove.

T. virginica (Virginian).* Flower of a Day; Common Spiderwort. *fl.* 1in. in diameter, closely packed in two rows in the bud, each with an ovate, scarious bract at the base; petals violet, purplish, or whitish, like the style and densely-bearded filaments, twice as long as the lanceolate-ovate sepals; cymes axillary and terminal, sessile, many-flowered. March to May. *l.* linear, broadest at base, mostly purple-veined. Stems 6in. to 2ft. high. Florida and northward, 1629. Hardy. (B. M. 105.)

Tradescantia—*continued.*

SYNS. *T. caricifolia* (B. M. 3546), *T. elata* (L. B. C. 1513), *T. glabra, T. sub-aspera* (B. M. 1597). Of this species there are several varieties.

T. v. alba (white). A variety having white flowers. (B. M. 3501.)

T. v. pilosa (pilose). *fl.*, upper umbels many, sessile in the axils of the leaves; lower ones pedunculate, with two lanceolate-linear bracts. (B. R. 1055.) SYN. *T. pilosa* (B. M. 3291).

T. v. tumida (tumid). *fl.*, umbels sessile in the axils. Stem thickened. SYN. *T. tumida* (B. R. 1840, 42).

FIG. 69. TRADESCANTIA WARSCEWICZIANA.

T. Warscewicziana (Warscewicz's). *fl.* many, densely crowded in a branched panicle; sepals and pedicels lilac; petals purple. May. *l.* narrow-oblong, about 8in. long, acuminate, sessile. Stem robust, erect, 4in. to 16in. high. Guatemala. Stove. See Fig. 69. (B. M. 5188.)

T. zebrina (Zebrina). A synonym of *Zebrina pendula.*

TRAGACANTH GUM PLANT. *See* **Astragalus Tragacantha.**

TRAGIA (named in honour of Jerome Bock, 1498-1554—generally called Tragus, the Greek for Bock [Buck]—a German botanist). ORD. *Euphorbiaceæ.* A large genus (about fifty species) of stove herbs or sub-shrubs, inhabiting warm regions. Flowers monœcious, apetalous, racemose. Leaves alternate, petiolate, toothed or lobed. The species, a few of which have been introduced, possess no beauty, and are not particularly interesting.

TRAGIUM. Included under *Pimpinella.*

TRAGOPOGON (from *tragos*, a goat, and *pogon*, a beard; alluding to the long, silky beard of the seeds). Goat's Beard. Including *Geropogon.* ORD. *Compositæ.*

Tragopogon—*continued.*

A genus of hardy, biennial or perennial herbs, natives of Europe, North Africa, and temperate and sub-tropical Asia. About forty species have been described, but the number may be considerably reduced. Flower-heads yellow or blue (or purple?), terminal, homogamous; ray florets ligulate, truncate, five-toothed; involucre cylindrical or narrowly campanulate, the bracts one-seriate, often much elongated; receptacle flat or at length convex, foveolate; achenes glabrous or slightly hispid; pappus bristles indefinite, one-seriate. Leaves alternate, linear, entire, amplexicaul, often grass-like. A selection of the introduced species is given below. Seeds only require to be sown in ordinary garden soil.

T. crocifolius (Crocus-leaved). *fl.-heads* violet, on terete peduncles; involucre five or six-leaved; achenes muricate-scabrous. June. *l.* narrow-linear, straight. *h.* 1ft. Italy, 1739. A glabrous biennial.

T. glaber (smooth).* *fl.-heads* purplish, solitary at the slightly-thickened tips of the stems or branches; involucre eight-leaved, as long as the rays. July. *l.* elongated, half-amplexicaul. Stem simple or rarely branched, terete. *h.* 1½ft. South Europe, 1704. A glabrous biennial. SYN. *Geropogon glaber* (B. M. 479).

T. major (greater). *fl.-heads* yellow; involucre of twelve to fifteen scales, the outer ones exceeding the ray florets; peduncles obconical-fistulose at apex. May. *l.* straight, lanceolate-linear, acuminate. *h.* 5ft. Austria, 1788. A glabrous perennial. (J. F. A. 29.)

FIG. 70. TRAGOPOGON PORRIFOLIUS.

T. porrifolius (Leek-leaved). Salsafy; Vegetable Oyster, &c. *fl.-heads* rose-coloured or flame-purple; involucre of eight scales; peduncles obconical-fistulose at apex. May and June. *l.* straight, lanceolate-linear, acuminate, the sheaths slightly dilated. *h.* 3ft.

Tragopogon—*continued.*

North Europe (naturalised in England). A glabrous biennial. See Fig. 70. (Sy. En. B. 801.) For culture, &c., *see* **Salsafy.**

T. pratensis (meadow-loving). Common Goat's Beard; Noon-flower; Shepherd's Clock; Star of Jerusalem, &c. *fl.-heads* yellow, ½in. to 2in. in diameter; involucre obconical, of about eight bracts, often streaked with brown; scapes scarcely thickened upwards. June and July. *l.* flexuous, gradually contracted upwards; radical ones channelled above. Stems stout, erect, 1ft. to 2ft. high. Europe (Britain). Plant glabrous, or the involucre slightly cottony. Biennial. (Sy. En. B. 798-800.)

T. roseus (rose-coloured). A synonym of *T. ruber.*

T. ruber (red). *fl.* rose-coloured or diluted with purple, on terete peduncles; involucre of about eight bracts. May. *l.* lanceolate-linear, slightly undulated, glaucous. Stems erect, leafy, glaucous. *h.* 1½ft. Siberia, 1826. Young plant cobweb-woolly. Perennial. SYN. *T. roseus.*

TRAILERS. *See* **Creepers.**

TRAINING. This term, as used in gardening, refers to the management of trees and plants, more especially when in a young state, by regulating their branches to give all a fair amount of space and exposure to light. Many trees and plants, if allowed to grow in a natural way, would assume proportions far beyond the limited accommodation which is available for them when under cultivation, and, besides, would be crowded and unfruitful. Pruning is first of all necessary, but with it Training is closely associated; the branches that are reserved either temporarily or permanently, when pruning, have afterwards to be dealt with in a similar manner in Training. Besides disposing of branches to give all plenty of space and light, there is also the necessity for regulating them, so as to prevent the sap flowing to any one branch, or part of the plant, at the expense of another, and to the detriment of both. An unequal flow of sap causes over-luxuriance in one part, and weakness in another. By Training, much of this irregularity may be prevented; in fact, it is one of the principal objects to be kept in mind. It is pretty generally known, by persons engaged in gardening pursuits, that sap will flow most readily into straight branches, which pass from the root in an upright, or nearly upright, direction, and not so freely into others proceeding obliquely or horizontally from the same starting-point. If, therefore, a tree, which it is desired should be about equally strong in all its branches, shows—as naturally it will do if not attended to—a disposition to

FIG. 71. FAN TRAINING.

grow irregularly, it must be corrected at an early stage. This constitutes one of the principal objects which may be effected by Training. The fact of sap flowing most forcibly into branches trained in an upright direction, supplies the means, as by elevating or depressing the points during the growing season, according to vigour shown, the circulation may be encouraged, or checked, in a most marked manner, and the development will be more generally alike throughout.

In the management of cultivated trees, several methods of Training are adopted, some kinds, and also some

Training—*continued.*

positions, being better adapted for one than for another. *Fruit-trees are those more especially referred to; it is* an easy matter to train annual climbers, both indoors and out, if only the necessary requirements of the plant are kept in view. The same may also be said of creepers or trailers generally, when their shoots are sufficiently thinned out. The methods of Training a plant to a rafter, on a wire trellis, or round a certain number of sticks, are matters which scarcely need an explanation.

The principal methods of Training adopted for wall-fruit trees are the Fan, Horizontal, Oblique, and Cordon, all being subject, more or less, *to modifications; for the open ground,* Pyramids, Bushes, and Standards are the shapes most favoured. Fan Training is generally adopted for stone fruits—Apricots, Cherries, Peaches, and Plums. The trees may be worked on dwarf or tall stocks, but on the latter the system is often modified by bringing some of the branches down on either side of the stem when there is space.

Fan Training must be commenced on maiden trees, that is, trees which have been worked the previous year and have made one strong shoot. This is cut down nearly to the point of union, in order to induce the production of shoots therefrom to eventually form the principal branches. One of the chief conditions to be aimed at in Fan Training is to get the head equally balanced, by having the same number of shoots on one side of the centre as on the other, as shown, for example, in Fig. 71. If sufficient can be secured the first year for starting an evenly-balanced head, an advantage is gained which the tree will always show afterwards. Should a young tree start irregularly, and misplaced shoots be allowed to develop for a season, it is not an easy matter then to secure others where they are wanted from the base. Sometimes, trees are cut hard back a second time, but this is a most objectionable practice; the less severe cutting is resorted to, the better, as it invariably leads to branches dying away sooner or later. By regulating the young shoots, depressing the stronger and elevating the weaker ones, much may be done to equalise the flow of sap, and render them all of about equal dimensions at the end of the season. In this and in other systems of Training, much has to be known by the operator from practical experience in the work, and constant attention is necessary from the first, to keep the shoots properly

FIG. 72. FAN TRAINING.

disposed and the sap regulated. Fig. 72 represents a tree trained without a centre shoot; the sap in such a tree would be equally distributed on both of the sides, and it is a comparatively easy matter to get the centre filled up when once the sides are equalised and the main branches established.

Horizontal Training is largely employed for Pear-trees, and sometimes for Apples that are to be grown against

Training—*continued.*

walls or as Espaliers in the open ground. Espalier trees are sometimes trained on horizontal wires, as shown in Fig. 73. When there is a great length, and in a straight line, wires are preferable to stakes, if only for their durability. A young tree with a single upright stem is cut

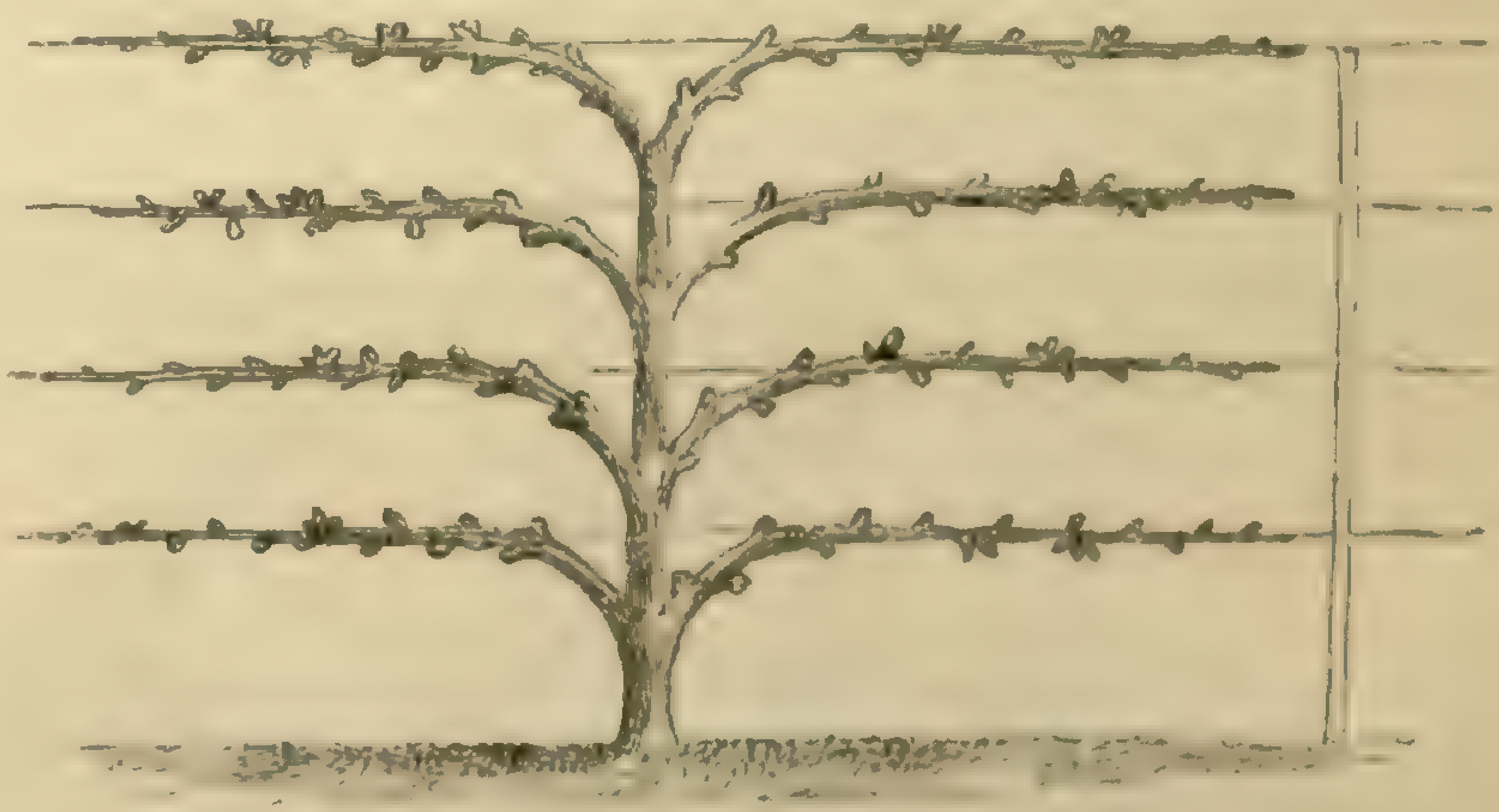

FIG. 73. HORIZONTAL TRAINING FOR ESPALIER TREES ON WIRES.

down to about 12in. from the ground, provided there are three buds situated near that point, one on either side, and one in an eligible position for growing to form the leader. The two side shoots should be trained on an angle for the first year, and induced to grow, if possible, with equal vigour; they can afterwards be

FIG. 74. HORIZONTAL TRAINING.

gradually brought down to a horizontal line, to form bottom branches. At pruning time the next year the leader is again cut down immediately above three other buds similarly situated as in the first year, but some 10in. or 12in. higher up, according to the distance required between the horizontal branches. Thus the work proceeds each year (as shown in Fig. 74); every pair of branches is

FIG. 75. HORIZONTAL TRAINING.

Training—*continued.*

therefore, in an established tree, a year older than the pair situate immediately above. Unfortunately, it is not safe to attempt more than one step up each year, although, with vigorous trees and a good climate, two may occasionally be secured by stopping the centre shoot in summer

FIG. 76. SINGLE OBLIQUE CORDONS

at the proper distance up, and training the laterals. This is not recommended, as it cannot be expected that a lateral from a young shoot will ever mature and form a branch equal in strength to another which starts from a ripened bud. Some prefer Training the branches on either side, so that they come alternately (see Fig. 75);

FIG. 77. TREBLE OBLIQUE CORDON.

but it is not always certain that every branch can be secured just at the point where it is wanted to insure alternate regularity.

In Oblique Training, a centre stem is reserved as in the Horizontal method; but the side branches are allowed to point upwards, instead of being kept to a level. This

FIG. 78 DOUBLE HORIZONTAL CORDON.

allows a freer circulation of sap, for the reason which has been already explained: the system, therefore, favours weak-growing sorts, and may be adopted with success for Peaches and Nectarines, where the Horizontal would not answer.

Cordon Training admits of a large number of trees being cultivated in a comparatively small space. Apples, Pears, and Cherries, the fruits of which are borne on small spur branches, are specially adapted for Training as Cordons. They need but little room, as the branches may

Training—*continued.*

be kept pinched back during summer. Single Cordons consist only of a single stem, which may be formed from a strong maiden tree. These may often be planted about 2ft. apart, and trained obliquely, as shown in Fig. 76. Other oblique forms of Cordons are trained with two, or even three stems (as in Fig. 77). Horizontal Cordons are best adapted for training along the sides of walks, or to form an edging or boundary to fruit-tree quarters, &c. The method of Training a Double Horizontal Cordon

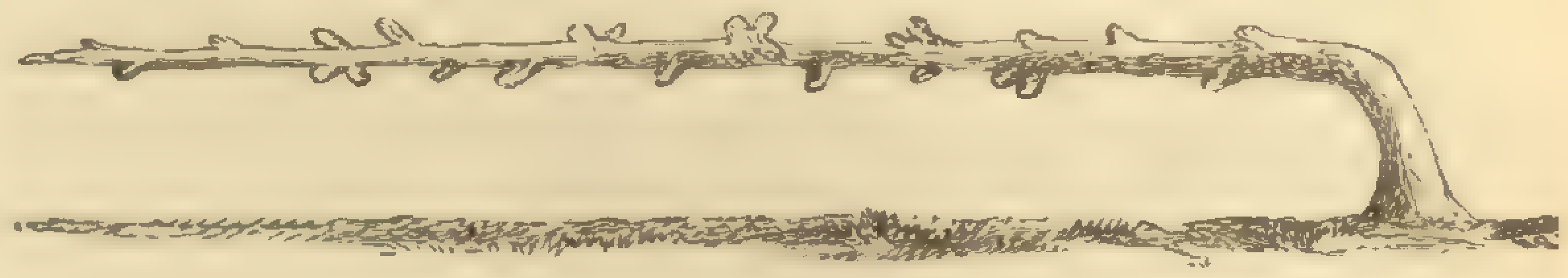

FIG. 79. SINGLE HORIZONTAL CORDON.

is shown in Fig. 78, and the Single, which is necessary for the ends, or where there are intersecting walks, in Fig. 79.

Pyramid Training is available for Pears, Apples, and Plums, also Cherries for pot-culture, and for outside in places where they can be depended upon to succeed away from a wall. There are several modifications of Pyramid Training, that most generally seen being an upright stem furnished with branches from bottom to top, which vary

FIG. 80. PYRAMID TREE.

in length, so as to form a pyramidal outline (see Fig. 80). The branches require regulating and stopping, as the trees grow, to keep a free circulation amongst them; and to

Training—*continued.*

obtain good specimens it is necessary to adopt a considerable system of Training in the early stages, by tying branches to fill up blanks, depressing the points of

FIG. 81. PYRAMID TRAINING, WITH BRANCHES BENT DOWNWARDS.

vigorous shoots, and encouraging weaker ones to grow more freely. When Pyramids are inclined to grow

FIG. 82. BUSH TRAINING.

Training—*continued.*

unduly strong, and make long shoots in place of fruiting spurs, a method of tying or bending down the points of the branches may be practised with advantage, on some of the strongest only, if this is considered sufficient. The

FIG. 83. STANDARD TREE.

tree would then appear as in Fig. 81, a habit which is sometimes naturally assumed by large pyramid Pear-trees of some varieties. Bush trees are practically Pyramids with the leader taken out; they need but little in the

FIG. 84. HALF-STANDARD TREE.

way of Training beyond thinning to prevent overcrowding. Bush-trained trees (see Fig. 82) of Apples and Pears, the former worked on the Paradise-stock, and the latter on the Quince, are especially adapted for small gardens:

Training—*continued.*

they are usually very productive, and require but little space.

Standard Training is best suited for orchards, market gardens, &c., where grass is grown beneath, and cattle or sheep feed thereon, or where other crops and bush fruit-trees are cultivated amongst them. There is no great necessity for Training Standard trees artificially; their heads develop evenly enough, as a rule, if they are kept sufficiently thinned, after being shortened back for the first year or two to get the foundation. Standard

FIG. 85. VERTICAL OR UPRIGHT TRAINING.

Training (see Fig. 83) is suitable for Apples, some kinds of Pears, Plums, and Cherries, in favoured localities. A Half-Standard (Fig. 84) is simply a Standard with a shorter stem.

Vertical or Upright Training requires a considerable amount of management in keeping the upright shoots

FIG. 86. APPLE-TREE TRAINED VASE-SHAPE, WITH DWARF STEM AND UPRIGHT BRANCHES.

Training—*continued.*

regulated and the tree evenly balanced. Two shoots must first be trained horizontally, and their points turned to form the uprights at the extreme ends (see Fig. 85). These must be kept in advance of all the others in the Training process; the centre will then be the last part of the tree to be furnished. This system is not so widely practised as others which have been already noticed.

Apple-trees trained in the shape of a vase, with dwarf stem (see Fig. 86), are very ornamental for lawns, &c., apart from the value of the fruit which is generally produced by them when established and kept pruned annually.

References to the methods of Training adapted to the various kinds of fruits named may be found under **Cherry, Currant, Fig, Gooseberry, Nectarine, Pear, Plum, Vine,** &c.

TRAMETES (from *trama*, the layer in *Hymenomycetes* that supports the hymenium, or spore-bearing surface on each side of it, in the gills or in the partitions between the pores). A genus of Fungi nearly allied to **Polyporus** (which *see*), from which, indeed, it differs in little save that in *Trametes* the substance of the trama is similar to that of the pileus, while in *Polyporus* it is different. The general form of the Fungi in the genus, and the situation and appearance of the pores in which the hymenium is situated. are well exemplified in *T. Pini*

FIG. 87. TRAMETES PINI, showing (*p*) Pileus and (*t*) Openings of Spore-bearing Tubes. *b*, Bark of Fir-tree.

(see Fig. 87). Nine species have been discovered in Britain, growing on various trees and shrubs, but all rare. *T. Pini* is, however, by no means rare on the Continent, where it sometimes does great injury to living Conifers, chiefly to Pines and Larches, but also frequently to Spruces, and less often to Silver Firs. In these trees it produces a condition known as the "Red Rot." The reproductive organs of the Fungus grow out of the sides of the trees, as rusty-brown masses of the form figured, and are from 3in. to 6in. across; and they continue to slowly increase in size for a long time. The wood is destroyed by the action of the mycelium of the Fungus. The other species of *Trametes* are not very hurtful. Hartig's *T. radiciperda* is a synonym of *Polyporus annosus*, which is a most dangerous foe to Conifers, and also, though less often, to dicotyledonous trees, destroying the roots and trunks.

Remedies. The treatment required is similar to that recommended for **Polyporus.**

TRANSPLANTING. The act of removing any plant or tree from one situation, and transferring it to another, lifting it bodily, and placing the roots in new soil. The operation is one which is of the greatest practical utility, and is in daily practice on a most extensive scale. Because of the possibility of Transplanting, seedlings may be raised in immense quantities in a comparatively small space, and carefully tended in the younger stages of growth; plants and trees that are gradually developing may be lifted, and allowed additional

Transplanting—*continued.*

space according to their requirements; and others, with some few exceptions, that reach a considerable size, may, with proper appliances, be transferred to particular situations for producing an immediate effect. Transplanting forms one of the chief divisions of labour in nurseries, where, by its aid, thousands of plants are being continually prepared, in a limited area, for dispersing, eventually, over hundreds of acres of land. Fruit-trees may also be prepared in any quantity in nurseries, and grown, if desired, into a size large enough for bearing, when, at the proper season, they may be safely lifted and despatched for planting elsewhere, in private and other establishments.

In private gardens, Transplanting of seedlings of various descriptions and sizes forms part of the routine work, more or less, all the year round, but more especially in spring and early summer. Amongst the most important points to consider are the proper seasons for performing the work successfully, the previous preparation of the ground, and also the plants, if necessary, the operation of lifting, conveying to the new situation, and replanting, and after-management until the roots have re-established themselves. It scarcely need be said that considerable knowledge of the subject, and the exercise of much judgment and care, are necessary for Transplanting on an extensive scale, and with success. Some of these provisions are always essentials in the management of every garden. It is next to impossible to lift a plant that has been growing in the ground, and place it again in soil elsewhere, without cutting or breaking some of the roots, which, at least in a young state, are invariably tender in nearly every kind of tree and plant. In some cases this is comparatively unimportant—it may even be advantageous—but in others it may be quite the reverse. Sometimes, the spongioles, which extract nourishment from the soil, are numerous, and if a few become injured, there are plenty left for sustaining the plant; in other instances, there are but few, and then a greater risk is incurred. The proper season for Transplanting depends upon the kind of plant. Seedlings of vegetable crops, and tender or half-hardy plants raised under glass, generally need inserting into new soil soon after they become large enough to handle, in order to allow each individual more space and to prevent injury from overcrowding. The operation may have to be repeated, in some instances, two or three times before the permanent positions are reached; but, as a rule, it is with such plants one of the easiest performed, the chief precautions requisite being a good watering and shade for a few days, should it be necessary. Transplanting is, however, always best performed in dull, mild, and preferably damp weather: there is then less evaporation going on, and the ground is usually in better condition for working. Dry weather is not favourable for the work; it is important to watch opportunities, and never to lift plants until the new situation has been prepared for receiving them. The act of pricking out seedlings and frequently removing plants when in a young state, so far as may be consistent with their well-being, causes an increase of roots and also keeps them closer to the base. This is an advantage, inasmuch as every operation renders success in any subsequent Transplanting more certain, because of its effect in preventing an unlimited extension of the main spongioles. Beyond the recommendation that all seedling plants raised under glass and in seed-beds, for growing out of doors, should be moved, so far as possible, only when the weather is favourable for a quick renewal of growth, little further need be said here respecting them. Root action takes place most quickly when the soil is light; it is therefore a good plan generally to provide a light compost for seedlings, even if they require to be transferred into a heavier one when more fully developed.

Transplanting—*continued.*

The Transplanting of fruit-trees, ornamental and forest-trees, and shrubs of every description, into what may be considered more or less permanent quarters, forms annually a very important undertaking in many establishments, particularly when alterations are taking place, and new gardens or grounds are being laid out. As the usual sources of supply are the nurseries, the trees have often to be forwarded a long distance before reaching their destination. This not unfrequently has an injurious effect if the soil falls away when unpacking, or the roots become dry from a certain amount of exposure, which is often unavoidable. There is a vast difference between Transplanting trees or shrubs from one place to another in the same garden, and procuring them from a nursery. In the former case, the roots need only be exposed for a very short time if the work is properly managed, and, providing the weather is favourable, it may be conducted at seasons when long exposure would entail certain loss. Frequent Transplanting in the nursery keeps, as already noted, the roots close home, and this renders lifting and packing a more successful process than it otherwise would be. Trees and plants of any description should never be longer on a journey than is really necessary; they should be unpacked immediately on reaching their destination, and, if they cannot be immediately planted in their new quarters, the roots should be covered with soil. Root action may, and doubtless does, in many subjects, recommence gradually, very soon or directly after the work of Transplanting is completed: hence the importance of placing trees or plants at once in permanent positions, to prevent further disturbance.

The methods of Transplanting vary considerably in detail, according to different plants, and the manner in which their roots are naturally disposed. Some are deep, others shallow, rooting; and at times it is desirable, as in the case of some fruit-trees, to check the natural tendency when Transplanting, and to place roots in a horizontal direction, instead of allowing them to proceed downwards. There are some directions which are generally applicable, and these may be briefly referred to; the special details attending the management of individual plants or kind of trees can only be given in dealing with their cultivation separately. Usually, the hole should be first prepared, unless there are two sets of workmen—one digging holes, and the other lifting the plants. The requisite breadth and depth depends on the quantity and length of roots, but plenty of space should be allowed to spread them at full length, and to work readily all round. If the top soil is of better quality than that beneath, it may be placed on one side of the hole and mixed with some new, if the plant requires it. The bottom of the hole should be well broken up, and raised a little in the centre under the base of the plant. Having thus far prepared the hole, the plant may be placed in position, and the roots spread out evenly. It is best to ascertain first if the depth is all right, by laying a rod or drawing a small line across the top, taking a fair level on both sides. On no account should tree-trunks be buried, though they may be kept slightly lower than the ground level, in order that water may readily pass to the roots. A rod or line laid close to the trunk will show immediately if it is necessary to raise or lower the base, and any alteration can soon be made before filling in. Carefully spread out all the roots with the hand, and, should there be any hollow places beneath, fill in some soil to insure a firm resting-place. All soil that is placed in contact with the roots, both beneath and above, should be rather fine, and in a friable condition; this is very important, as hard lumps, or anything of too heavy a nature, would not fill up the cavities satisfactorily. Once the roots are arranged and covered, the holes may be filled up and trodden sufficiently, as the work proceeds,

Transplanting—*continued.*

to render the whole firm. All trees that are of sufficient height to be blown about and injured by rough winds, should be securely staked so soon as transplanted, or supported in some way, for preventing injury to the roots which would be caused were the trees allowed to sway about. In the case of standard or tall trees, transplanted for immediate effect, or for fruit-bearing, two or three guy ropes prevent this most effectually, and they may frequently be dispensed with so soon as the roots re-establish themselves. When lifting a tree for Transplanting, it is best to tie up with some soft cord any branches that may be near the base, and to commence digging out a spit of soil outside the line to which it is calculated the roots will reach. Then use a fork from the base of the tree outwards to separate the roots, but preserve as large a ball of earth as may be convenient to move, unless the tree is of a sort which transplants readily with bare roots. All roots which become mutilated had better be cut clean off before replanting; also any small ones, which sometimes die back—as, for instance, when trees have to be sent on a long journey. The necessity for watering depends very much on the season and the nature of the soil; if the subsoil is gravelly, a heavy watering would seldom do any harm, and water is the best of all substances for consolidating the top soil and roots. Watering is not so requisite in autumn as in spring Transplanting; but attention must be given to the subject throughout the summer immediately following. A mulching of loose litter or light manure, placed above the roots for a season, tends greatly to prevent evaporation, and to keep them moist even in dry weather.

The foregoing remarks are generally applicable to the Transplanting of any fruit and forest-trees, also all shrubs of moderate size that are amenable to the operation. The best seasons for performing the work, like other details, vary with individual subjects; some will transplant successfully at almost any season when carefully managed, while others are best moved at one particular period of the year. As a rule, all deciduous trees and shrubs transplant best in the autumn as soon as most of their leaves have fallen. These, and also Conifers and shrubs of all kinds, may generally be moved with safety any time during October, and up till the middle of November. There is then sufficient warmth in the soil to encourage the production of new roots before winter, and this is of great advantage. Transplanting may be proceeded with all through the winter whenever the weather is favourable; but the seasons when there is a certain amount of activity—as October and the early part of November, already mentioned—and a period immediately preceding the resumption of active growth in spring (February and March), are preferable. From the middle of November till the middle of January is the worst period for Transplanting, as vegetation is then so inactive, and the temperature of the ground very low. This period should not, therefore, be chosen by anyone who has but a moderate amount of the work to perform in any one season. Evergreen plants may be successfully moved later in the spring than deciduous ones, and Hollies transplant better in May, just as new growth begins, than at any other season. Rhododendrons may best be moved in March, or early in April. Such plants as half-hardy annuals, raised under glass for flowering in the open borders, are best transplanted into permanent positions before their flower-stems show; and hardy perennials which require division should be attended to in spring, before the annual growth is begun. Naturally, anything which is growing in a pot may be planted out in the open at periods when it would often be hazardous to attempt lifting the same individual from the ground. Transplanting in its entirety is therefore a subject the details of which have an extremely wide application;

Transplanting—*continued.*

the after-success will generally well repay for close attention to detail when performing the work. Briefly, the principal points are these: Lift the roots with the least possible injury, make the new holes sufficiently wide that all may be spread at full length; and, after regulating them with the hand, cover with soil that is in a good, workable condition. Avoid having any roots doubled underneath—when the tree is placed into its new position this must be guarded against—and secure the stem from rocking about with the wind afterwards. Give a copious watering soon after planting, or at a future period, according to the season and state of the soil, to consolidate all the earth which has been moved, and to supply moisture, of which the roots will be in special need, to enable them to re-establish themselves.

Transplanting of trees and shrubs of an unusual size is practicable by the use of mechanical means and plenty of strength. For filling up a blank in any important place, such as an avenue, or for planting with a view to producing an immediate effect, the work is sometimes undertaken, though, of course, under more or less exceptional circumstances. The trees must first be at hand, or be procurable within reasonable distance for removing, and they must be of a nature likely to transplant successfully with due care and previous preparation if necessary; they must also be situated where removal is practicable. With a view to safely Transplanting trees of a larger size than usual, a system of preparation one year in advance is advisable, particularly if the specimens are valuable. This consists in cutting a trench round the stem, at a distance which depends on the size of the ball which it is intended to move, and severing with a knife the large roots that reach thus far, making a clean cut. Previous to digging the trench, some new soil, of a light rather than heavy nature, should be prepared and brought alongside ready for use. Without allowing the roots to be long exposed, the trench should be filled up again with the fresh compost. In this, new feeders will usually push, during the following season, from the points which have been mutilated; and when the time for removing the tree arrives, the next trench requisite should be cut outside the one already referred to, and the young roots carefully preserved. Of course, cutting off the roots will effect a check on the vegetation and growth above ground. When there is a danger of the check being too great, the preparation is sometimes extended over two years, and only a half cut at one time. When this is practised, the circumference of the intended circular trench should be divided into about four equal parts, and two of these, opposite each other, dug out; the other two, which will also be opposite, may be left for treating similarly the next season. The principles which have been detailed in treating of the Transplanting of trees and plants of moderate size are similarly applicable, but on a larger scale, to those of unusual dimensions. If a ball of earth to be removed measures 2ft., 4ft., or 6ft. through, then the hole must be prepared so as to allow plenty of additional space for the roots to be spread out their full length. In starting to lift, it is best to begin wide, and allow sufficient room to work: the roots may be all the more readily separated from the soil and preserved from mutilation.

For Transplanting trees with a great weight of soil attached to their roots, different machines or tree-lifters are in use; the management of these invariably requires the closest attention on the part of every workman who assists, as well as the person in charge. Hence, this work, when mechanical power is necessary, should be executed only by those who understand the business from practical experience. Two of the best tree-lifting or Transplanting machines are those known respectively as Mr. McNab's and Mr. Barron's. The diameter of the ball is limited with Mr. McNab's to that of the inner part of the machine,

Transplanting—*continued.*

which travels on two high wheels and is provided with handles for guiding it. There are double rollers before and behind; those furthest from the handles lift out, and allow of the machine being placed in position for lifting with the tree in the centre. The ball is reduced to the proper size, and bound round with a piece of strong canvas and cords; then two strong boards, which belong to the machine, are placed just underneath at the bottom, and ropes are passed under their ends at right angles, and brought up to the rollers of the machine. When everything is ready, the plant is wound up sufficiently high for travelling by means of four cross-shaped, iron levers or handles, which fit, at the point of intersection, on the ends of two of the rollers. One of the disadvantages in the use of this machine is the liability of the soil to fall out from the bottom of the ball, but this largely depends on the kind of soil and its tenacity, and also on the amount of roots which the plant possesses. The boards are also sometimes liable to shift from their proper places beneath, and allow the plant to fall through; but this is not a very frequent occurrence. These are but some of the risks that must be encountered if Transplanting machines are used; they only happen occasionally if the balls are firm, and everything is properly adjusted.

FIG 88. BARRON'S TRANSPLANTING MACHINE.

Transplanting—*continued.*

Mr. Barron's Transplanting machine (see Fig. 88) is capable of moving very large trees and masses of earth; it is, as may be imagined, very strongly constructed, and travels with the tree in an upright position. The weight is borne by two very strong rollers, whose ends rest on beams about 20ft. in length, that pass from the front to the back part of the machine, one on each side. There are four wheels, which stand rather high, to allow of the ball of earth being suspended beneath the beams, but above the ground line, for travelling. Two strong planks are placed through beneath the ball, as near as can be under the centre, to which are attached the lifting ropes or chains, and cross planks are also placed above these, to make sure of bringing the mass up together. When all is in readiness, the rollers are very gently turned by means of straight, steel, lever bars, and a snatch catches in cogs on each roller, and prevents it from running back. Whether ropes or chains are used for lifting, they must be of great strength, as a serious accident might be the result at any minute were anything to break. If the ground over which the wheels are to pass, when loaded with a tree, is not very firm, it is necessary to use planks 3in. thick for forming a roadway. When the tree reaches its destination, it has to be brought over the hole, which should by that time be in readiness, and lowered into position by having the process of lifting reversed. This requires, if anything, even greater care than lifting, as there is more danger of a great weight overcoming the workmen when they are lowering than when they are raising it.

The whole details of working any Transplanting machine are beyond what can be properly described on paper so as to be understood; the operation can only be learnt from persons who understand the matter and have a machine before them, and by practical experience. The latter is in this case, as in most others, the best teacher; and it becomes necessary that anyone who undertakes the removal of large trees should have had such experience, not only for performing the work successfully, but also because the operation is one which, if improperly executed, endangers the lives of workmen employed, apart from accidents to which they may be subjected in the event of any unavoidable mishap.

TRAPA (abridged from *calcitrapa*, the Latin name of an instrument called Caltrops, furnished with four spines, formerly used in war to impede the progress of cavalry). Water Caltrops. ORD. *Onagrarieæ*. A small genus (about three species) of curious, stove or hardy, floating herbs, inhabiting Central and Southern Europe,

Trapa—*continued.*

and tropical and sub-tropical Asia and Africa. Flowers axillary, solitary, peduncled; calyx tube short, the limb four-parted, two or all the segments persistent and becoming spinescent on the fruit; petals four, white, small; stamens four. Fruit bony, one-celled, large, obovoid, with four angles, indehiscent, with a short, cylindric beak at the top. Leaves dimorphic; submerged ones opposite, root-like, pinnatipartite, with filiform segments; floating ones rosulate, rhomboidal, the petioles having a spongy dilatation near the apex. The large seeds of *T. bispinosa* are sweet and edible; in Cashmere, and other parts of the East, they are common food, and are known under the name of Singhara Nuts. The species require a rich, loamy soil, and to be grown in a cistern, or a large pot or tub of water. Propagation may be effected by seeds.

T. bispinosa (two-spined). Singhara Nut-plant. *fr.* ¾in. long and broad, glabrous or hairy; two opposite angles each with an often retrorsely scabrous spine, the other two angles sometimes obsolete. *l.*, floating ones 2in. by 2½in. to 3in., very villous beneath, the posterior margin entire, the anterior lightly crenate; petioles 4in. to 6in. long, woolly. India and Ceylon, 1822. Stove. Doubtfully distinct from *T. natans*.

FIG. 89. UPPER PORTION OF PLANT OF TRAPA NATANS, showing Rosette of Floating Leaves.

T. natans (swimming).* Jesuit's Nut; Ling; Water Caltrops; Water Chestnut. *fr.* ¾in. broad, the four angles all spinescent, but the two lateral spines shorter. *l.*, floating ones 1in. long, toothed or incised-toothed on the anterior margin, sparingly villous on the nerves beneath; petioles 2in. to 4in. long, glabrescent. Persia to Europe and the Upper Nile, 1781. Hardy. See Figs. 89 and 90. (B. R. 259; G. C. n. s., x., p. 212.)

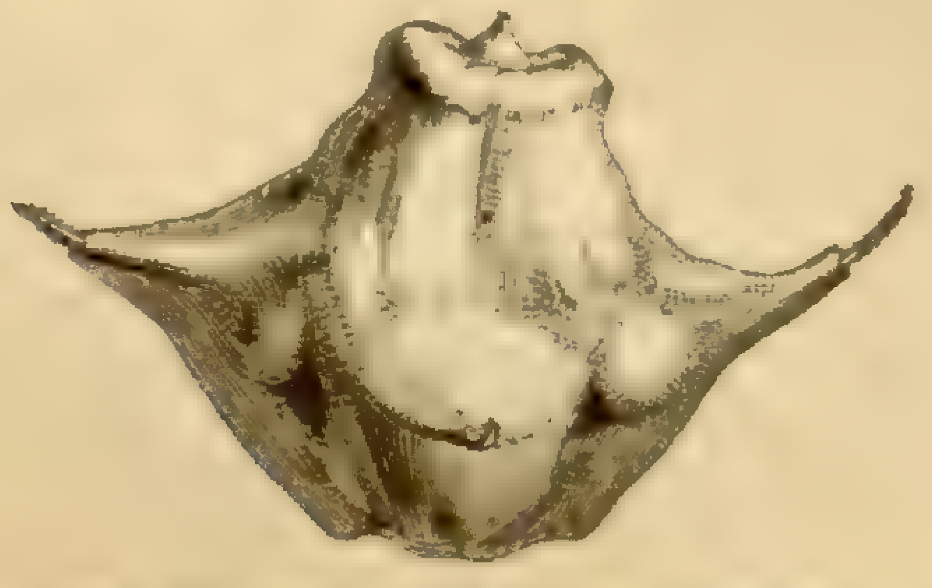

FIG. 90. FRUIT OF TRAPA NATANS.

T. verbanensis (Lago Maggiore).* *fr.* trigonous, compressed, with two short horns. *l.* deltoid, the two upper sides dentate, with bimucronulate teeth. Lago Maggiore, 1886. Hardy. Whole plant glabrous.

TRAPEZIFORM, TRAPEZOID. Scarcely differing from rhomboid; having four sides, the opposite ones not parallel.

TRAPS. It is advisable to be provided with some of these in gardens, for the destruction of various kinds of vermin. The chief kinds of Traps required are those used for catching rats, mice, and moles. Rats may be caught by the ordinary kind of Trap used by keepers for rabbits, &c., if placed in their runs; but these destructive animals are more quickly disposed of by poisoning, if it can be safely practised, and sometimes by the aid of a gun. Mice are often destructive in seed-rooms and seed-beds, when the seed is of a kind which they like. An ordinary brick, and what is known as a Figure of 4 Trap, baited with a small piece of cheese, will generally catch them with certainty; also the small box Mousetraps commonly used in houses. For moles, the iron Traps with a spring and double claws, which clip the animal, from whichever side it proceeds, round the body, have generally superseded, and are preferable in gardens to, the old kinds made of wood and small wire. Traps, as they are generally called, may be formed in various ways for particular purposes—as, for instance, to catch earwigs, which destroy the flower-buds of Chrysanthemums, Dahlias, &c. The best plan for trapping these is to put some dry material, such as hay or old beanstalks, into small flower-pots, and invert them on top of the stakes used for supporting the plants; or they may be placed amongst the branches. The earwigs conceal themselves in the pots, and, if these are examined occasionally, the insects may be shaken out and destroyed. A few small lettuce or tender cabbage leaves, also form, at times, an effectual Trap for slugs when these attack seedlings. Instead of retreating to their usual hiding-places, they will often shelter themselves under leaves purposely laid, and may easily be looked for and destroyed each morning. Cockroaches and beetles may be caught in large quantities by setting Traps in their haunts in the shape of open saucers or wide-necked bottles, partially filled with treacle, or any sweetened liquid. The Traps should be set so that the insects may enter them, but not get out again. Bottles partially filled with sweetened beer, or treacle, and suspended in vineries, often prove excellent Traps for catching large flies and wasps, which attack and eat the grapes.

TRATTENIKIA. A synonym of **Marshallia** (which *see*).

TRAUTVETTERIA (named in honour of Prof. Ernest Rud. Trautvetter, a Russian botanist of this century). ORD. *Ranunculaceæ.* A monotypic genus. The species is a hardy perennial, thriving in ordinary soil. It may be propagated by divisions.

T. palmata (palmately-lobed). False Bugbane. *fl.* white, small, corymbose-paniculate; sepals three to five, usually four, concave, petal-like, very caducous; petals none. July and August. *l.* palmately lobed; radical ones large, the lobes toothed and cut; cauline ones few, alternate. Stems 2ft. to 3ft. high. North America and Japan. (B. M. 1630, under name of *Cimicifuga palmata.*) SYN. *Actæa palmata.*

TRAVELLERS' JOY. A common name for **Clematis Vitalba** (which *see*).

TRAVELLERS'-TREE. A popular name for **Ravenala madagascariensis** (which *see*).

TREASURE FLOWER. A common name for **Gazania** (which *see*).

TRECULIA (named in honour of M. Auguste Trécul, of Paris, author of a monograph on *Nuphar lutea*, in 1843). ORD. *Urticaceæ*. A small genus (two or three species) of stove, glabrous trees or shrubs, natives of tropical Africa. Flowers diœcious; heads sessile or shortly pedunculate, at the axils or the defoliated nodes; bracts under the head few, small, somewhat biseriate, but by no means forming a true involucre. Leaves alternate, shortly petiolate, entire, coriaceous, penniveined; stipules lanceolate, rather small, caducous. *T. africana*, the only species introduced, is an evergreen tree. It requires a compost of rich loam and leaf mould, and a moist atmosphere. Propagation may be effected by cuttings of the ripened shoots, inserted in sandy loam, under a bell glass, with bottom heat.

T. africana (African). African Bread-fruit Tree; Okwa-tree. *fl.* green, in globose, shortly pedunculate heads. September. *fr.* in a head 1ft. or more in diameter. *l.* alternate, very shortly petiolate, thickly coriaceous, 6in. to 14in. long, sometimes 7in. to 8in. broad, oblong-ovate or lanceolate, abruptly and obtusely acuminate, acute or oftener cordate at base; stipules 1in. long, caducous. *h.* 60ft. to 80ft. 1872. (*B. M.* 5986.)

TREE. Any woody plant of perennial duration which rises from the ground with a distinct trunk.

TREE FERN. A common name for Ferns with an arborescent caudex: *e.g.*, species of *Alsophila*, *Cyathea*, and *Dicksonia*.

TREE-GUARDS. These, in some form, are requisite for placing round all newly-planted trees in public streets, avenues, &c., where it is often necessary to provide some protection for the stem for several years. Besides protecting trees, the Guards act as an efficient support against injury from the wind after transplanting. The most substantial and best-formed, though rather expensive, Tree-guards, are those of circular shape, made of iron, the lower part, which is fixed into the ground, being wider in diameter than that which surrounds the tree stem higher up. A common form of Tree-guard consists of three upright wooden posts, placed in a triangular shape, and fixed with pieces of wood at an equal distance from each other at the top. The kind of Guard which causes least injury to the roots is, of course, preferable; the tree should always be tied at the top with cord, so that it cannot possibly come in contact with any part of the Guard and be injured. For protecting the bark of trees planted in streets from being cut by mischievous individuals, ordinary wire netting, of fine mesh, may be tied round the stems when the trees are first planted.

TREE MALLOW. *See* **Lavatera arborea.**

TREE MIGNONETTE. A title given to plants of Mignonette when grown singly to flower in large pots on tall stems as single specimens. Mignonette plants grown in tree form are interesting and ornamental subjects for conservatory decoration; but for general usefulness, five or six plants grown in each pot as dwarf specimens are most desirable. *See* **Mignonette.**

TREE OF CHASTITY. *See* **Vitex Agnuscastus.**

TREE OF HEAVEN. *See* **Ailantus.**

TREE OF LIFE. A common name for **Thuya** (which *see*).

TREE OF SADNESS. *See* **Nyctanthes Arbor-tristis.**

TREE PANAX. *See* **Dendropanax.**

TREE SLUG. *See* **Slugs.**

TREFOIL. *See* **Trifolium.**

TREFOIL, BIRD'S-FOOT. *See* **Lotus corniculatus.**

TREFOIL, GOLDEN. An old name for **Anemone Hepatica** (which *see*).

TREFOIL, MILK. An old name for the genus **Cytisus** (which *see*).

TREFOIL, MOON. A common name for **Medicago arborea** (which *see*).

TREFOIL, SCENTED. A common name for **Melilotus** (which *see*).

TREFOIL, SHRUBBY. A popular name for **Jasminum fruticans** and **Ptelea trifoliata** (which *see*).

TREISIA. Included under *Euphorbia*.

TRELLIS. A framework fixed in glass houses near the roof, on which to train plants and trees, such as Vines, Peaches and Nectarines, Cucumbers, and Melons, none of which could receive proper attention unless so treated. A Trellis may also be formed to fix into a large pot for the accommodation of an individual plant, as, for example, a Stephanotis or Bougainvillea grown for exhibition. Galvanised wire of different sizes is generally used, according to the different purposes for which it is intended. In Vineries and Peach-houses, the Trellis should be fixed, not less than 1ft. from the glass, as it is always required; in Cucumber and Melon-houses, it may be in pieces, so as to be removed when the house is used for growing other plants which do not require a Trellis. The wires for training Vines upon should be fixed horizontally, 9in. apart; and for Peaches and Nectarines 6in. is preferable. When a Trellis is made in movable sections, the wires are usually crossed, to form a diamond-shaped pattern, and this allows of plants being tied and trained in any direction. Pyramid and balloon-shaped Trellises are those usually selected for specimen pot-plants.

TREMANDRA (from *tremo*, to tremble, and *anthos*, a male; the anthers vibrate with the least movement of the air). ORD. *Tremandreæ*. A genus comprising only a couple of small, greenhouse, more or less stellate-tomentose, Australian shrubs. Flowers five-parted; stamens apparently in a single series; disk crenate, almost five-lobed. Leaves opposite, toothed. For culture of the only species introduced, *see* **Tetratheca** (to which it is closely allied).

T. stelligera (star-bearing). *fl.* on pedicels shorter than the leaves; sepals tomentose or villous, two to three lines long; petals but little longer; anthers dark purple. Summer. *l.* opposite, shortly petiolate, ovate, obtuse, 1in. to 1½in. long, coarsely and irregularly toothed or rarely entire. *h.* 2ft. or more. Plant densely stellate-hairy.

T. verticillata (whorled). A synonym of *Platytheca galioides*.

TREMANDREÆ. A small natural order of usually Heath-like, glabrous or glandular-hairy, extra-tropical Australian shrubs. Flowers usually red or purple, regular, solitary, on axillary pedicels; sepals four or five, very rarely three, free, valvate in bud; petals as many, hypogynous, spreading, induplicate-valvate in bud; stamens twice as many, hypogynous, free; filaments short; anthers two or four-celled, opening in a single, terminal pore; torus small, or rarely expanded into a disk between the petals and stamens. Capsule usually flattened, two-celled, opening loculicidally at the edges. Leaves small, alternate, opposite, or whorled, rarely larger and stellate-tomentose. The order contains three genera—*Platytheca*, *Tetratheca*, and *Tremandra*—and about twenty-one species.

TREMANTHUS. A synonym of **Styrax** (which *see*).

TREMEX. A genus of Sawflies, so closely related to **Sirex** (which *see*), and so similar in general appearance and habits, as to render a detailed account of the species unnecessary. This genus has not been met with in Great Britain; but one species (*T. Columba*), popularly known as the Pigeon Tremex, is destructive

Tremex—*continued.*

to the wood of Pear-trees, and also to Elms and Maples, in Canada and the United States, and may not improbably be introduced into Britain in trees from those countries. The female has the body about 1½in. long, with the ovipositor extending nearly ½in. backwards. The wings have a spread of about 2½in.; they are smoky-brown. The head and thorax are reddish-brown, with black markings; and the abdomen is black, with seven yellow cross-bars, each, except the first two, broken in the middle. The male is little more than half as large as the female, and the markings are less conspicuous, the body being reddish, varied with black, and the wings more transparent.

Should this insect be accidentally imported, the measures to be employed against it are the same as those recommended under **Sirex.**

TRENCHING. A term applied to the process of digging ground for the special purpose of increasing its depth for the better cultivation of various crops. It is chiefly practised in autumn, and the surface thrown up roughly for exposure to the weather. In commencing to trench a piece of ground, the soil, for about the width of 3ft., should be dug out a spit or more deep along

Trenching—*continued.*

one end, and wheeled to the opposite end, where it is intended to finish. The depth which should be taken out varies according to the nature of the subsoil; if this is unfit to bring to the surface, it should be dug and still left beneath. Another width should then be marked out, and the top spit of soil turned over to take the place of that wheeled away, the bottom being, in its turn, treated like the first; and so on. When the soil is good enough to allow of the bottom spit being brought to take the place of the top, the first trench must be taken out to the full depth, and the bottom broken up. Trenching invariably deepens and improves garden land, but it is not always advisable to bring up the bottom soil at first; this is sometimes of a nature which causes actual harm to crops, and had better be left at the bottom below the limit which the roots reach. Trenching must, therefore, be practised with judgment. The bottom soil may always be loosened and dug, with advantage to that on the surface; and if some loose leaf mould or light manure is mixed into that beneath during the process, it will, in course of time, improve the whole bulk, and render it of a better description than before to a much greater depth.

FIG. 91. TREVESIA EMINENS

TRENTEPOHLIA. Included under *Cyperus*.

TREVESIA (called after the family Treves de Bonfigli at Padua, who were supporters of botanical research). ORD. *Araliaceæ*. A genus embracing eight or nine species of prickly or unarmed, stove shrubs or small trees, inhabiting tropical Asia, Malaya, and the Pacific Islands. Flowers polygamous, in panicled umbels; petals eight to twelve, often cohering as a cap in the fertile flowers; stamens as many as the petals; pedicels not jointed; bracts small or wanting. Leaves ample, palmatifid, or digitately or pinnately compound. *T. eminens* and *T. palmata* require a mixture of sand, loam, and leaf mould. Cuttings will readily root in sand, under a glass, in heat.

T. eminens (eminent). *l.* long-stalked, roundish in outline, palmatifidly divided about two-thirds of their depth into nine lanceolate segments, which have each a prominent rib and both edges serrated, the teeth distinct, small, but sharp-pointed. Philippines, 1882. Probably a mere form of *T. palmata*. See Fig. 91 (for which we are indebted to Mr. Wm. Bull).

T. palmata (palmate-leaved). *fl.* greenish-white; panicles 1½ft. long, straggling, clothed, when young, with red-brown tomentum. March. *l.* very large, sometimes 2ft. long, palmate or digitate, nearly glabrous; segments lobed or sub-pinnatifid. Shoots covered with reddish hair and many prickles. *h.* 10ft. to 15ft. India, 1818. Tree. SYNS. *T. sundaica*, *Gastonia palmata* (B. R. 894).

T. sundaica (Sunda Isles). A synonym of *T. palmata*.

TREVIRANA. A synonym of **Achimenes** (which *see*).

TREVOA (named in honour of Trevo, a Spanish botanist). ORD. *Rhamneæ*. A small genus (two or three species) of much-branched, greenhouse trees, natives of South America. Flowers fascicled below axillary spines; calyx four or five-lobed; petals four or five, hooded; stamens four or five, the filaments pilose; pedicels short, one-flowered. Leaves opposite, ovate or obovate, three-nerved, serrulated. *T. trinervis* has been introduced, but is now probably lost to cultivation.

TREWIA (named in honour of C. J. Trew, 1695-1769, of Nuremberg, a botanical author). SYN. *Rottlera* (of Willdenow). ORD. *Euphorbiaceæ*. A genus consisting of only two species of stove trees, often branched from the base, with soft wood, natives of the East Indies. Flowers diœcious, apetalous; disk none; male racemes lateral, opening before the leaves, long and loose, the flowers rather large, solitary, pedicellate, with a bract; female flowers solitary on an axillary peduncle or indefinitely racemose. Leaves opposite, petiolate, broad, entire, three to five-nerved. *T. nudiflora*, the only species introduced, succeeds in a compost of sandy loam and peat; it may be readily increased by cuttings, inserted in sand, under a glass, in heat.

T. nudiflora (naked-flowered). *fl.*, racemes axillary; males often exceeding the leaves, bearing flowers along nearly the whole of their length; females few-flowered. May. *l.* broadly ovate, acute or acuminate, cordate, obtuse or contracted-sub-cuneate at base, five-nerved, entire. Branchlets glabrous, or the young ones pubescent. *h.* 5ft. and upwards. East Indies, 1796. (B. F. S. 281.)

TRI. This term, used in compounds, signifies three: *e.g.*, Tricuspidate, three-cusped.

TRIACHYRUM. A synonym of **Sporobolus** (which *see*).

TRIADELPHOUS. When the stamens of a flower are disposed in three bundles.

TRIADICA. A synonym of **Sapium** (which *see*).

TRIANDROUS. Having three stamens.

TRIANEA (named in honour of M. José Triana, a botanist and traveller in Columbia). SYNS. *Hydromystria*, *Jalambicea*. ORD. *Hydrocharideæ*. A genus comprising three or four species of stove or greenhouse, stoloniferous, aquatic herbs, natives of North America, Mexico, and tropical South America, now regarded, by Bentham and

Trianea—*continued.*

Hooker, as synonymous with *Limnobium*. Spathes unisexual, two-leaved in both sexes; male flowers two or three in a spathe, long-pedunculate; females solitary in a spathe, sessile or shortly petiolate. Leaves fascicled at the nodes, petiolate, the blades swimming on the top of the water, ovate or rounded-cordate, sometimes (not always) of a thick, spongy substance below. Stems stoloniferous. *T. bogotensis*, the only species yet introduced, thrives in stove or greenhouse heat. Propagation is readily effected by runners.

T. bogotensis (Bogota). *fl.* small, six-parted; bracts hyaline, embracing the peduncles. *l.* clustered, oblong or orbicular, flat-convex, below spongy-reticulated; petioles dilated at base. Columbia, 1879. The correct name of this plant is *Limnobium bogotense*. (G. C. n. s., xv., pp. 466-468; R. G. 980.)

TRIANTHEMA (from *treis*, three, and *anthos*, a flower; alluding to a frequent disposition of the blossoms). ORD. *Ficoideæ*. A genus embracing about a dozen species of stove or greenhouse, diffuse, prostrate herbs, rarely sub-shrubs, inhabiting the warm regions of Asia, Africa, and Australia, and the West Indies. Flowers axillary, solitary, cymose or fascicled, sessile or pedunculate, rarely sub-spicate on the terminal branches; calyx lobes five; petals absent; stamens five or indefinite. Leaves opposite, unequal, petiolate, obovate, ovate, or linear, entire. Three species have been introduced, but they are interesting only to the botanist.

TRIAS (from *treis*, three; alluding to the arrangement of the floral envelopes). ORD. *Orchideæ*. This small genus embraces only three species of dwarf, tufted or creeping, stove Orchids; two are natives of Moulmein, and the other inhabits the East Indian peninsula. Sepals sub-equal, spreading, the lateral ones adnate at base with the foot of the column; petals small, oblong or linear; lip slightly spreading at apex, narrow, rather thick; scapes lateral, slender, leafless, one-flowered. Pseudo-bulbs rather small, sub-globose, one-leaved at apex. *T. oblonga*, probably the only species in cultivation, thrives best in an intermediate house, in small pans of peat and sphagnum, or on blocks with a little peat and sphagnum fastened amongst the roots.

T. oblonga (oblong-leaved). *fl.* fuscous-green, with a purplish lip; scapes erect, much shorter than the leaves. April. *l.* small, oblong, acute, coriaceous. *h.* 3in. Moulmein, 1837.

FIG. 92. FLOWERING BRANCH OF TRIBULUS TERRESTRIS.

TRIBLEMMA. Included under *Asplenium*.

TRIBRACHIUM. A synonym of **Bulbophyllum** (which *see*).

TRIBULUS (*Tribolos* was the old Greek name used by Theophrastus, from *treis*, three, and *bolos*, a point; each carpel is often armed with three or four large spines). Caltrops. ORD. *Zygophylleæ*. A genus comprising about fifteen species of loosely-branched, stove, greenhouse, or hardy herbs, dispersed over the warmer regions of the globe. Flowers white or yellow, solitary, pseudo-axillary, pedunculate. Leaves stipulate, opposite, or by abortion alternate. Most of these plants, several of which have been introduced, are weedy-looking subjects, and interesting only to a botanist. *T. terrestris*, a South European plant, is shown at Fig. 92.

TRICERAIA. A synonym of **Turpinia** (which *see*).

TRICHÆTA. Included under **Trisetum** (which *see*).

TRICHANTHA (from *thrix*, *trichos*, a hair, and *anthos*, a blossom; alluding to the slender pedicels). ORD. *Gesneraceæ*. A genus of two species of stove, creeping or climbing shrubs, natives of Columbia. Flowers solitary or fascicled in the axils, pedicellate, ebracteate; calyx free, coloured, ciliated-plumose, five-parted; corolla dingy violet, the limb and tube striped or angled with five longitudinal, yellow marks; limb loosely oblique, of five short, equal lobes. Leaves opposite, very different, one being ovate or oblong and acuminate, and the other dwarf. *T. minor*, the only species known in gardens, thrives in well-drained pots of peat, leaf mould, and sand, and is readily increased by means of cuttings, inserted in pots of sandy soil, and plunged in bottom heat.

T. minor (lesser). *fl.*, corolla 2in. long, tubular, sub-ventricose, crinite-hairy, constricted above the base; limb obliquely four-lobed, the upper lobe bifid, with a club-shaped appendage; peduncles one-flowered. *l.*, the large one shortly petiolate, ovate, acuminate, entire, hairy beneath, slightly succulent. Stem climbing, radicant, adpressedly pilose or glabrous. 1864. (B. M. 5428; G. C. 1864, p. 172.)

TRICHARIS. A synonym of **Dipcadi** (which *see*).

TRICHILIA (from *tricha*, by threes; the ovary and capsule are usually trilocular). ORD. *Meliaceæ*. A genus comprising about thirty species of stove trees and shrubs, natives of tropical Africa and America. Flowers rather large for the order, disposed in axillary, many-flowered panicles; calyx four or five-toothed or cleft; petals four or five, imbricated; staminal tube eight to ten-cleft or parted, rarely entire. Leaves trifoliolate or imparipinnate; leaflets opposite or alternate, often many-jugate, very rarely bijugate. A selection of the introduced species is here given. They are not much grown, and rarely flower in this country. A compost of loam and peat is most suitable. Propagation may be effected by cuttings of the ripened wood, with the leaves intact, inserted in sand, under a glass, in heat.

T. glabra (smooth). A synonym of *T. havanensis*.

T. havanensis (Havana). *fl.* white, long-pedicellate, densely crowded in very short, umbelluliform panicles. June. *l.* shortly petiolate, three-jugate; leaflets sessile, opposite, obovate, cuneate at base, rounded or obtuse, sometimes slightly acuminate, at apex, firm, opaque, somewhat shining. *h.* 20ft. Havana, 1794. Shrub or tree. SYN. *T. glabra*.

T. hirta (hairy). Bastard Ironwood. *fl.* whitish; panicles puberulous, two to four times exceeded by the leaves. June. *l.*, leaflets five-jugal, variable, elliptic or oblong-lanceolate, tapering to the base, glabrous, the lower ones smaller. *h.* 12ft. West Indies, 1800. Tree.

T. odorata (fragrant). *fl.* yellowish, sweet-scented; pedicels much longer than the flowers; cymes glabrous, many-flowered. June. *l.*, leaflets five-jugal, elliptic or oblong, 2in. to 6in. long; petioles naked. *h.* 12ft. to 25ft. West Indies, 1801. A low tree or shrub. (A. B. R. 637; H. E. F. 128.)

T. spondioides (Spondias-like). White Butterwood. *fl.* of a greenish-yellow colour; panicles puberulous, one-fourth the length of the leaves, the divisions three to eleven-flowered. June. *l.*, leaflets seven to ten-jugal, ovate-oblong, oblique at base, acute at apex, glabrous, the lower ones smaller. *h.* 15ft. to 20ft. Tropical America, 1870. Tree. (Ref. B. 293.)

TRICHINIUM (from *trichinos*, covered with hairs; alluding to the shaggy appearance of the blossoms). ORD. *Amarantaceæ*. A genus comprising about fifty species of greenhouse herbs, under-shrubs, or rarely small shrubs, limited to Australia. Flowers in dense, globular, ovoid, or cylindrical spikes, very rarely elongated and interrupted; perianth usually pink or straw-colour, with a short, hard tube and five hairy segments; stamens five, but usually one, two, or three, without anthers. Leaves alternate, narrow or rarely obovate. Only three species have been introduced. They are all perennials, and thrive under cool greenhouse treatment, in any rich soil. Loam, rotten manure, and sand, make a suitable compost. The plants do best on an airy shelf, in full sunlight, and should be watered freely during the growing season. After flowering, water should be almost entirely withheld. Propagation is readily effected by means of the thick roots, which should be cut into pieces about 1in. long, and inserted in sand, in bottom heat.

T. alopecuroideum (Fox-tail Grass-like). A synonym of *T. exaltatum*.

T. exaltatum (exalted). *fl.*, perianth about ¾in. in diameter, the segments yellow, with dull red tips; spikes erect, on long peduncles, at length oblong-cylindrical, about 2½in. in diameter. June. *l.*, radical and lower ones oblong-lanceolate, 3in. to 5in. long, contracted into long petioles; upper ones small, sessile. *h.* 2ft. to 3ft. 1838. A stout plant. (B. R. 1839, 28, under name of *T. alopecuroideum*.)

T. Manglesii (Mangles').* *fl.*, perianth ¾in. to 1in. long, the segments with pink or whitish tips; spikes globular or ovoid, about 2in. in diameter, the coloured tips of the perianth protruding from the long, white hairs. June. *l.*, radical ones long-petiolate, varying from ovate to linear, obtuse or acute, 1in. to 3in. long; cauline ones few, narrow, very acute. Stems decumbent, ascending, or rarely erect, 6in. to 12in. long. 1838. (B. M. 5448; F. d. S. 2396; G. C. 1864, p. 555; I. H. 464; R. H. 1866, p. 291.)

T. Stirlingii (Stirling's). *fl.*, perianth scarcely ½in. long, the segments plumose, with pink tips; spikes globular, solitary at the ends of the stems or loosely paniculate, ¾in. to 1in. in diameter. June. *l.* lanceolate, oblong, or almost linear; lower ones obtuse, shortly petiolate; upper ones small, more acute, sessile. Stems long, procumbent or ascending, and (as well as the leaves) clothed with white hairs. 1838.

TRICHOCARPA. Included under **Deparia** (which *see*).

TRICHOCAULON (from *thrix*, *trichos*, a hair, and *caulon*, a stem; alluding to the bristles that tip each tubercle). ORD. *Asclepiadeæ*. A small genus (two species) of dwarf-growing succulents, natives of South Africa. Flowers small, proceeding from the angles near the upper part of the stem, sub-solitary; calyx five-partite, the segments acuminate; corolla deeply five-lobed; outer corona deeply bilobed. Leaves none. Stems dwarf, stout, fleshy, many-angled; angles tuberculate; tubercles tipped with a bristle. For culture, *see* **Stapelia.**

T. piliferum (bristle-bearing). *fl.* ½in. to ¾in. in diameter, sessile in the furrows of the stem; corolla between funnel and bell-shape, pale yellow-red without, dark purple within. Branches tufted, straight, cylindric, simple, erect, proceeding from a short, stout rootstock. 1882. (B. M. 6759.) SYNS. *Piaranthus piliferus*, *Stapelia pilifera*.

TRICHOCENTRUM (from *thrix*, *trichos*, a hair, and *kentron*, a spur; alluding to the long, thin spur of the labellum). ORD. *Orchideæ*. A genus including about fourteen species of stove, epiphytal Orchids, natives of tropical America. Flowers mediocre or rather large; sepals and petals sub-equal, free, spreading; lip at base connate with the column, forming a pitcher, produced into a descending spur, above the pitcher erect, biauriculate or naked; lateral lobes scarcely dilated, nearly erect; column short, thick; pollen masses two, ovoid; scapes short, many-sheathed, one or rarely two-flowered. Leaves coriaceous. Stems very short, one-leaved, at length thickened into a small, fleshy pseudo-bulb. The

Trichocentrum—*continued.*

species thrive best in an intermediate temperature, in a moist, shady position, attached to blocks of soft wood or pieces of tree-fern stem. Water must be given all the year round, but care must be taken to prevent the roots being in contact with stagnant moisture. Propagation may be effected by division.

T. albo-purpureum (white-and-purple).* *fl.* large, freely produced; sepals and petals bright cinnamon-brown outside, tawny-yellow inside; lip white, with two large, purple spots near the base, the disk veined with rosy-purple, passing to yellow, and having a crest of four rosy-purple keels. *l.* sessile, oblong, acute, shining green, 4in. to 6in. long. Brazil, 1866. (B. M. 5688; G. C. 1866, 219; W. O. A. 204.)

T. capistratum (haltered). *fl.* one to a peduncle; sepals and petals yellow; lip white, dotted and blotched with purple, remarkable for having its base extended into five short spurs. *l.* oblong-lanceolate, purplish. Costa Rica, 1871.

T. cornucopiæ (cornucopia). A small plant, with yellowish-white flowers, having more botanical than horticultural interest. Rio Negro (?), 1866. (Ref. B. 77; R. X. O. 177.)

T. fuscum (fuscous). *fl.* on short peduncles; sepals and petals purplish-green, spreading; lip much longer than the petals, cuneate, waved, with a slender spur at base, two-lobed at apex, lower down blotched with rose-colour and spotted with red. *l.* oblong, acute, spreading, somewhat twisted, purplish-green, minutely dotted. Mexico, 1841. (B. M. 3969; B. R. 1951.)

T. f. Krameri (Kramer's). A large-flowered variety, with a longer and thinner spur than in the type. Brazil, 1885.

T. Hoegii (Hoege's). *fl.* very large, borne on a zigzag peduncle; sepals and petals greenish-yellow, with a purple middle area; lip white, with brilliant purple lines and blotches, and two blunt, yellow calli at the base, pandurate, undulated, notched at the tip; spur with a clavate, notched apex. *l.* robust, horny, cuneate-oblong, acute. Mexico, 1882. A small but distinct plant.

T. ionophthalmum (violet-eyed). *fl.*, upper sepal and petals very light yellowish-maroon-brown, with brown dots at top, unguiculate, blunt; lateral sepals wholly brown; lip whitish, with a large, violet blotch on each basilar angle, pandurate. *l.* broader and shorter than those of *T. albo-purpureum* (which this plant resembles). Amazons, 1876.

T. maculatum (spotted). *fl.* large; petals white, spotted with purple, oblong, obtuse; lip with a yellow crest, obovate, bilobed, very obtuse; spur very long. February. *l.* very thick, fleshy, linear-oblong, obtuse, spotted with red. Sierra Nevada, 1844.

T. orthoplectron (straight-spurred).* *fl.* large; sepals and petals light cinnamon-brown, tipped with yellow, cuneate-oblong; lip white, with a crimson-lake blotch on each side of the base, and five bars or semi-abortive keels of the same colour between the blotches, the disk in front of the crest being yellow; spur tapering to an acute point. October. Brazil. A curious and beautiful epiphyte. (W. O. A. 272.)

T. Pfavii (Pfau's).* *fl.* in pairs on a raceme, as large as those of *Oncidium Gardneri*; sepals and petals half brown, half white, spathulate, obtuse; lip white, with a red blotch in the middle of its stalk, cuneate-flabellate, bilobed, crisped. Central America, 1881. (G. C. n. s., xvii. 117; I. H. ser. iii. 587; R. G. 1103.)

T. P. zonale (zonal). *fl.*, sepals and petals entirely brown at their base, or the brown broken up into blotches, obtuse or acute; lip having one large, purple blotch or two darker ones before its base. 1883. An interesting and variable form.

T. porphyrio (porphyry-like). *fl.* solitary, about 2in. in diameter; sepals and petals brown, unequally margined and tipped with yellow, cuneate-oblong, acute; lip rich magenta-purple, faintly margined with white towards the point and having a rectangular, sulphur-yellow blotch on the disk in front of the three purple lines of the crest. *l.* cuneate-oblong. South America, 1884. A very handsome species. (I. H. ser. iii. 508.)

T. pulchrum (pretty). *fl.* yellow and white; sepals much spreading, oval-elliptic; lip erect, obovate, cuneate at base, emarginate at apex. July. *l.* two or three, thickened at base, oblong, obtuse or acute, sometimes mucronate. Peru.

T. purpureum (purple). *fl.*, sepals and petals of a dull olive-green; lip purple, obovate-oblong, emarginate; spur thick, curved; scapes small, radical, one or two-flowered. Demerara.

T. tenuiflorum (slender-flowered). *fl.* dingy brown and white, small; sepals and petals narrow, the former acute, the latter obtuse; lip linear-obovate, with a pair of plates occupying the whole of the base. Bahia.

T. tigrinum (tiger-striped).* *fl.* one or two to a peduncle; sepals and petals greenish-yellow, transversely barred and distinctly spotted with purplish-brown; lip pure white, 1½in. long, nearly 2in. across the dilated apex, with a yellow crest on the disk, and on each side at the base a wedge-shaped blotch of purple. *l.* oblong, more or less dotted with deep red. Ecuador, 1869. A remarkably handsome and desirable species, producing its blossoms while in a very small state. (I. H. ser. iii. 282.)

T. t. splendens (splendid). A fine variety, having the base of the large, obcordate lip of a rich purple colour. 1886.

TRICHOCEPHALUS. Included under **Phylica** (which *see*).

TRICHOCEROS (from *thrix*, *trichos*, a hair, and *keras*, a horn; alluding to the two hairy, antenna-like processes from the column). ORD. *Orchideæ.* A small genus (six or seven species, which may be reduced to three or four) of stove, epiphytal Orchids, natives of Peru and Columbia. Flowers loosely racemose at the apices of the peduncles, mediocre or small, rather long-pedicellate; sepals sub-equal, free, and spreading, larger than the petals; lip sessile at the base of the column, spreading; pollen masses four; bracts shorter than the pedicels. Leaves few, distichous, coriaceous or fleshy. *T. parviflorus*, the only species yet introduced, thrives in small pans or baskets of peat and sphagnum.

T. parviflorus (small-flowered). *fl.* green, marked with purple and brown spots and bars, small; lip three-parted, minutely ciliolate; peduncle slender, nearly terete, axillary. Pseudo-bulbs small, bearing a single, fleshy leaf. Columbia, 1870. (R. X. O. i. 9.)

TRICHODESMA (from *thrix*, *trichos*, a hair, and *desmos*, a bond; the anthers are bound to each other by hairs). SYNS. *Borraginoides, Friedrichsthalia, Leiocarya, Pollichia, Spiroconus, Streblanthera.* ORD. *Boragineæ.* A genus comprising nine or ten species of coarse, hardy or half-hardy herbs, inhabiting Africa, tropical and Central Asia, and Australia. Flowers in terminal racemes; calyx deeply five-cleft; corolla of five often long-acuminate lobes; stamens five; anthers connivent by means of hairs. Leaves opposite or alternate, entire. *T. zeylanicum*, the only species known to cultivation, is a coarse, hardy annual, thriving under ordinary treatment.

T. zeylanicum (Cingalese). Ceylon Borage. *fl.* pale blue, in simple racemes; calyx segments ¼in. to ½in. long; corolla lobes broad, longer than the calyx. *l.* linear to oblong-lanceolate, often 3in. to 4in. long, the margins usually recurved. *h.* several feet. Southern India, Ceylon, Mascarene Islands, and Australia. (B. M. 4820.)

TRICHODIUM. This genus is now included under *Agrostis.*

TRICHOGLOTTIS (from *thrix*, *trichos*, hair, and *glottis*, a tongue; alluding to the fine hairs on the labellum). ORD. *Orchideæ.* A small genus (four or five species) of inconspicuous, stove Orchids, mostly natives of the Malayan Archipelago. Flowers small or mediocre, one or a few on very short, lateral peduncles; sepals spreading, the lateral ones very broad, adnate to the foot of the column, the dorsal one and petals oblong; lateral lobes of lip short, erect, the middle one rather broad; column short, wingless. Leaves distichous, scattered at the sides of the stem, narrow. Stem leafy, elongated, not pseudo-bulbous. The species mentioned below thrive in small pans of peat and sphagnum, in the East India house, and require an abundant supply of moisture when growing.

T. cochlearis (spoon-like). *fl.* white, with purple bars on both sides of the sepals and petals, smaller than those of *Saccolabium violaceum*; spur conical; lip spoon-like, very thick, with a few purple blotches; inflorescence very short, zigzag, four-flowered. *l.* like those of *Sarcanthus rostratus*, but thicker, and with a quite unequal point on one side projecting much farther than the other one. *h.* 8in. Sumatra, 1883.

T. fasciata (banded).* *fl.*, sepals and petals cuneate-oblong, acute, the lateral sepals falcate; sepals closely cross-banded with pale chestnut-brown; lip whitish, with yellow tips to the side plates of the anterior part and a few purplish spots on the keel of the under side. *l.* distichous, oblong, bilobed. Eastern tropical Asia, 1872. (W. O. A. 208.)

TRICHOLÆNA. Included under *Panicum.*

TRICHOMANES (the old Greek name used by Theophrastus, from *thrix*, *trichos*, a hair, and *manos*, soft; alluding to the delicate nature of the fronds). Bristle Fern. Including *Feea, Hymenostachys, Involucraria, Lacostea, Lecanium, Microgonium, Phlebiophyllum.* ORD. *Filices.* A genus comprising about 100 species of mostly stove Ferns, inhabiting tropical and temperate climates. Fronds varying from simple to decompound-multifid,

Trichomanes—*continued.*

membranous and pellucid, smooth or bearing simple, forked, or stellate hairs. Sori marginal, always terminating a vein, more or less sunk in the frond; involucre monophyllous, tubular, closely corresponding with the frond in texture, the mouth truncate or winged, or slightly two-lipped; receptacle filiform, elongated, often considerably exserted beyond the mouth of the involucre, capsuliferous principally at the base; capsules sessile, depressed, surrounded by an entire, broad, nearly transverse ring, bursting vertically. The introduced species are here described; except where otherwise stated, they need stove heat. They should be "grown in square, shallow pans and boxes, well-drained in the ordinary way, and having about 2in. of peat soil mixed with nearly half its bulk of sand and small broken potsherds; but soft sandstone is best. For the creeping sorts, the soil should be raised in the form of a mound; and for those that have long-extending rhizomes, if soft stone cannot be had, it is desirable to invert a pan or common deep pot, covering it with a layer of soil, as already explained, to which the plant will cling, and soon form a green hillock. Junks of wood answer the purpose, but in a moist, close, and warm atmosphere, Fungi and insects breed, and in a short time the wood decays, causing unnecessary disturbance of the whole mass of the plant" (J. Smith). *See also* **Ferns.**

T. achilleæfolium (Achillea-fronded). A synonym of *T. rigidum.*

T. alatum (winged).* *sti.* tufted, 2in. to 4in. long, winged above. *fronds* 3in. to 12in. long, 1in. to 4in. broad, lanceolate or ovate-lanceolate, bi-tripinnatifid; main rachis winged throughout; pinnæ lanceolate, acute, cut more than half-way to the rachis; lobes again often sharply toothed. *sori* two to twelve to a pinna, terminal on the segments, the mouth spreading. West Indies, 1824. Very variable in robustness and hairiness. SYN. *T. attenuatum* (H. S. F. i. 39c).

T. anceps (double). A synonym of *T. maximum.*

T. angustatum (narrowed). A synonym of *T. tenerum.*

T. apiifolium (Apium-fronded).* *sti.* tufted, 4in. to 6in. long, strong, erect, fibrillose, the tuft densely so at the crown. *fronds* 9in. to 18in. long, 4in. to 8in. broad, ovate, quadripinnatifid; main rachis only slightly winged towards the apex; lower pinnæ 4in. to 6in. long, 1in. to 1½in. broad, lanceolate, acuminate; pinnules with numerous segments, which are again cut down into ultimate divisions about one line long. *sori* two to twelve to a pinnule; involucre short, turbinate. Philippine Islands, &c. SYN. *T. meifolium.*

T. attenuatum (attenuated). A synonym of *T. alatum.*

T. auriculatum (eared). *rhiz.* strong, wide-creeping, tomentose. *fronds* nearly sessile, 6in. to 12in. long, 1½in. to 2in. broad, bipinnatifid; rachis wiry, very slightly winged thoughout or above only; pinnæ short-stalked, ovate, rhomboidal, obliquely cuneate at base, irregularly pinnatifid half-way down or more, the lowest anterior lobes often considerably prolonged beyond the others. *sori* two to twelve to a pinna, the mouth truncate. Japan, &c., 1871. SYN. *T. dissectum.*

FIG. 93. PORTION OF FERTILE FROND (UNDER SIDE) OF TRICHOMANES BANCROFTII.

T. Bancroftii (Bancroft's).* *sti.* 1in. to 2in. long, broadly winged to the base. *fronds* 3in. to 6in. long, 1in. broad, ovate-oblong, pinnatifid down to a broadly-winged rachis; segments oblong, blunt, crenate, either imbricated or with a small space between them. *sori* two to six to a pinna, the mouth rather dilated; receptacle long, filiform. Tropical America. See Fig. 93. (H. G. F. 56.)

T. bipunctatum (two-dotted). *rhiz.* wide-creeping, tomentose, rather slender. *sti.* 1in. to 2in. long, naked, slightly winged above. *fronds* oblong-lanceolate or oblong-deltoid, 2in. to 3in. long, about 1in. broad, tripinnatifid, the rachis winged throughout; pinnæ lanceolate, cut away on the lower side at the base; ultimate segments strap-shaped, ⅛in. to ¼in. long. *sori* one or more to a pinna; involucre winged. Mauritius. SYN. *T. Filicula.*

T. Bojeri (Bojer's). A synonym of *T. cuspidatum.*

T. botryoides (Botrys-like). *cau.* erect, tufted. *barren fronds* 2in. to 3in. long, 1in. or rather more broad, on very short stipes, pinnatifid to a slightly-winged rachis, with linear-oblong, deeply-toothed lobes, the apex rooting and copiously proliferous. *fertile fronds* on stipes 1in. to 2in. long, narrow-linear, the apex foliaceous. *sori*, lower ones stalked, usually free; upper ones connected at the base. Tropical America. SYN. *Feea nana.*

T. brevisetum (short-bristled). A synonym of *T. radicans.*

T. concinnum (neat). *rhiz.* filiform, tomentose. *sti.* three to four lines long, proliferous, winged upwards. *fronds* ovate, ½in. to ¾in. long, rounded at top, cuneate at base, bipinnatifid; lower pinnæ flabellately pinnatifid, the lowest pinnules bifid. *sori* usually lateral, rarely terminal; involucre immersed. Tahiti.

T. crinitum (hairy). *sti.* tufted, one to three lines long, slender, villous. *fronds* 2in. to 8in. long, ½in. to ¾in. broad, ovate-lanceolate or linear-oblong, bipinnatifid; pinnæ reaching nearly to the rachis, the lower ones ovate-oblong, cut about half-way down into broadly linear segments; surface slightly hairy; margins ciliated. *sori* one or two to a pinna, terminal, the mouth dilated. West Indies.

T. crispum (curled). *rhiz.* short or somewhat elongated, strong, tomentose. *sti.* scattered or tufted, 2in. to 6in. long, strong, tomentose. *fronds* 4in. to 12in. long, 1½in. to 2in. broad, lanceolate, fully pinnate or pinnatifid nearly to the rachis; lower pinnæ ¾in. to 1in. long, oblong, obtuse, spreading, or even deflexed, often incurved and crisped; rachis clothed with reddish-brown hairs. *sori* one to eight placed round the apex of the pinnæ, the mouth two-lipped; receptacle long, exserted. Tropical America, 1828.

T. c. pilosum (pilose). *fronds* clothed with reddish hairs. 1863.

T. curvatum (curved). A synonym of *T. javanicum.*

T. cuspidatum (cuspidate). *fronds* indistinctly but very shortly stalked, about ½in. broad, the outer edge rounded and more or less lobed, the base truncate or more or less cuneate. Involucres one to six, the tube sunk in the frond, the mouth dilated, but scarcely two-lipped. Mauritius. SYN. *T. Bojeri.*

T. dissectum (dissected). A synonym of *T. auriculatum.*

T. elongatum (lengthened). A variety of *T. rigidum.*

T. erosum (bitten). *rhiz.* thread-like. *sti.* filiform, ¼in. to ½in. long. *fronds* very variable in shape, lanceolate to semicircular, entire or repand-pinnatifid, 1in. to 2in. long, abundantly veined. *sori* one or many placed along the upper margin of the frond; involucre immersed, cylindrical, with a large, collar-like limb. Seychelles. SYN. *T. muscoides.*

T. exsectum (scolloped). *rhiz.* wide-creeping, slender, tomentose. *sti.* slender, naked, 1in. to 3in. long. *fronds* 6in. to 12in. long, 1in. to 2in. broad, pendent, flaccid, lanceolate, tripinnatifid, the main rachis narrowly winged in the upper half; pinnæ distant, flaccid, the upper ones often 3in. to 4in. long, the lower ones ovate or lanceolate, divided to a narrowly-winged rachis, with a few deeply-toothed or pinnatifid pinnules. *sori* one to four to a pinna, the mouth truncate. Chili.

T. Filicula (little Fern). A synonym of *T. bipunctatum.*

T. fimbriatum (fringed). A synonym of *T. superbum.*

T. floribundum (bundle-flowered). A synonym of *T. pinnatum.*

T. gemmatum (twin). *rhiz.* strong, wiry, tomentose, beset with numerous long, black fibres. *sti.* 1in. to 3in. long, naked, wiry, winged above. *fronds* 2in. to 6in. long, 1in. to 2in. broad, erect, rather rigid, ovate-oblong, bipinnatifid, the main rachis narrowly winged; pinnæ erecto-patent, cut down to a narrowly-winged rachis; lower pinnules deeply forked; segments linear-filiform. *sori* one to eight to a pinna, minute, axillary, the tube stalked. South America.

T. Hartii (Dr. Hart's). *cau.* short, slender, sub-erect. *sti.* tufted, 2in. to 4in. long, winged in the upper part. *fronds* deltoid, 3in. to 6in. long, tripinnatifid, the main rachis distinctly winged; pinnæ eight to twelve-jugate, crowded, sessile, all except the lowest lanceolate; lowest pair lanceolate, deltoid; ultimate segments oblong, obtuse, erecto-patent. *sori* usually only one to each secondary segment, except in the deeply-pinnatifid, large ones on the lower side of the lowest pair of pinnæ. Sierra Leone, 1882.

T. humile (dwarf). *rhiz.* creeping, deeply intermatted. *sti.* ¼in. to ½in. long, slender, winged above. *fronds* 1in. to 2in. long, ½in. broad, bipinnatifid, lanceolate-oblong, cut down to a narrowly-winged rachis; segments pinnatifid, with simple or once-forked, linear lobes. *sori* solitary on the upper side of the pinnæ, the tube more or less exserted, the mouth two-lipped. Java, &c.

T. incisum (cut). A synonym of *T. sinuosum.*

T. javanicum (Javan). *cau.* tufted, with numerous strong, wiry roots. *sti.* 1in. to 4in. long, wiry, erect, naked or villous. *fronds* 2in. to 8in. long, 1in. to 2in. broad, ovate-lanceolate, acuminate, once fully pinnate; lower pinnæ often 1in. long, ¼in. broad, obtuse or acute, finely toothed. *sori* one to four, placed in the axils of linear segments on the upper side of the pinnæ;

Trichomanes – *continued.*

receptacle much exserted. India, Java, &c. SYNS. *T. curvatum*, *T. rhomboideum*.

T. Kaulfussii (Kaulfuss'). *rhiz.* wide-creeping, strong, tomentose. *sti.* 2in. to 4in. long, strong, compressed, winged above. *fronds* 4in. to 12in. long, 1½in. to 2in. broad, ovate-lanceolate, acuminate, once-pinnatifid down to a broadly-winged rachis; segments linear-oblong, rounded or acute, toothed, the largest 1in. long, ¼in. broad; main rachis densely, and the surface slightly, hairy. *sori two to twelve to a pinna, the tube more or less* exserted; receptacle long, filiform. West Indies, 1862.

FIG. 94. TRICHOMANES KRAUSSII.

T. Kraussii (Krauss').* *rhiz.* wide-creeping, tomentose. *fronds* sessile or nearly so, 1in. to 3in. long, ½in. broad, oblong, attenuated or cuneate at base, once deeply pinnatifid down to a broadly-winged rachis; lobes linear-oblong, nearly entire, or toothed or sinuate-pinnatifid. *sori* one to six on the apex of the frond, the tube more or less exserted, the mouth with two large lips. West Indies. See Fig. 94.

T. labiatum (lipped). *fronds* variable in shape, roundish and cordate at one or both ends, or sub-ovate and narrowed at base and apex, pellucid dark green; fertile ones with a distinct midrib. *sori* confined to the apex, usually one, rarely two to four; involucres tubular, free or slightly sunk, with tufts of hairs on the margined sides; lips large, expanded and rounded. British Guiana, 1885.

T. Luschnatianum (Luschnat's). A variety of *T. radicans*.

T. maximum (greatest).* *rhiz.* stout, creeping. *sti.* strong, erect, 3in. to 6in. long. *fronds* 1ft. to 1½ft. long, 6in. to 9in. broad, ovate, quadripinnatifid; pinnæ erecto-patent, ovate-lanceolate, the largest 4in. to 6in. long, 2in. broad; pinnules lanceolate-deltoid, 1in. or more long, cut down to the rachis into segments, which are again deeply pinnatifid; ultimate segments ⅛in. to ¼in. long. *sori* two to eight to a pinnule; involucre cylindrical, the mouth two-lipped. Java, 1863. SYN. *T. anceps* (H. S. F. i. 40c, 3).

T. meifolium (Spignel-leaved). A synonym of *T. apiifolium*.

T. membranaceum (membranous). *fronds* sub-sessile, membranous, sub-orbicular, 2in. to 3in. broad, more or less deeply cut from the circumference towards the centre; lobes broad, rounded, or narrow, the margin fringed with a double series of peltate scales. Involucres numerous, placed round the edge of the frond, the tube sunk, the mouth two-lipped. Tropical America. (H. E. F. 76.)

T. muscoides (Moss-like). A synonym of *T. erosum*.

T. obscurum (obscure). A synonym of *T. rigidum*.

T. parvulum (rather small). *rhiz.* wide-creeping, interlaced. *sti.* 1in. long, wiry, slender, tomentose below. *fronds* ¼in. to ½in. each way, orbicular, flabellately cut about half-way down from the outer edge towards the base into narrow, irregular segments. *sori four to six, terminal* on the central segments. Japan and China, &c. Greenhouse. (H. S. F. 39A.)

T. Petersii (Peters'). *sti.* one to two lines long. *fronds* ¼in. to ½in. long, linear to obovate-spathulate, crenate or slightly lobed. *sori* solitary, terminal, the tube sunk in the frond, the mouth much dilated, but entire. United States, 1875. Greenhouse.

Trichomanes—*continued.*

T. pinnatinerva (pinnate-nerved). *rhiz.* dark, tomentose, thread-like. *sti.* a quarter to one line long. *fronds* scattered, ovate, two to three and a-half lines long, one to two lines broad, pellucid, clear, bright green. British Guiana, 1886. A very minute Filmy Fern.

T. pinnatum (pinnate). *cau.* erect, tufted. *sti.* strong, wiry, erect, naked or slightly hairy, 3in. to 12in. long. *fronds* simply pinnate in the typical state, 4in to 18in. long, 3in. to 12in. broad, the apex often rooting and proliferous; pinnæ in two to ten opposite or alternate pairs and a terminal one, 2in. to 6in. long, linear, obtuse or acute, sharply and finely toothed, the upper edge usually free from the stem at the base, the under one attached and often furnished with a broad, decurrent wing. *sori* placed all round the pinnæ; receptacle long, exserted. Tropical America, 1825. SYN. *T. floribundum*.

T. Pluma (feathery). *rhiz.* short-creeping, clothed with bright brown scales. *sti.* 2in. to 4in. long, terete, wiry. *fronds* lanceolate, 4in. to 6in. long, 1in. to 1½in. broad, decompound; rachis stiff, terete throughout; pinnæ crowded, twenty to thirty-jugate, spreading, less than ½in. broad; lower pinnules sparsely pinnatifid, cut into distant, bristle-like, dichotomously-forked lobes, ⅛in. to ¼in. long. *sori* few, placed near the base of the upper pinnæ; receptacle very long. Malay Isles.

T. punctatum (dotted). *fronds* stalked or sub-sessile, ¼in. to ½in. broad, sub-orbicular or obovate, undulated or slightly lobed at the margin. *sori* one to four, placed on the outer edge of the frond and more or less exserted, the mouth distinctly two-lipped. Tropical America.

T. pusillum (dwarf). *rhiz.* wide-creeping, tomentose. *fronds* nearly sessile, 2in. to 3in. long, ½in. to 1in. broad, oblong or obovate, cuneate-attenuated below, once deeply pinnatifid down to a broadly-winged rachis; lobes linear or oblong, toothed or deeply pinnatifid. *sori* one to four round the apex of the frond, the tube exserted, the mouth with two large, rounded lobes. Tropical America. SYN. *T. quercifolium*.

T. pyxidiferum (box-bearing).* *rhiz.* wide-creeping, tomentose, rather slender. *sti.* 1in. to 2in. long, naked, winged above. *fronds* 1in. to 6in. long, 1in. to 1½in. broad, ovate-oblong, tripinnatifid, the main rachis very narrowly winged; pinnæ ovate-rhomboidal, pinnatifid to the rachis, the lower pinnules again deeply pinnatifid; ultimate segments often emarginate at apex. *sori* one to four to a pinna, axillary, the tube more or less winged; receptacle filiform, exserted. Tropical America.

T. quercifolium (Oak-fronded). A synonym of *T. pusillum*.

T. radicans (rooting).* Cup Goldilocks; Killarney Fern. *rhiz.* wiry, wide-creeping, tomentose. *sti.* strong, wiry, ascending, 2in. to 6in. long, naked or nearly so, the upper part sometimes winged. *fronds* 4in. to 12in. long, 2in. to 6in. broad, tripinnatifid, the main rachis very narrowly winged, often free, except near the apex; lower pinnæ 1in. to 4in. long, ovate-rhomboidal, cut down to a narrowly-winged rachis; pinnules again deeply pinnatifid, ovate-rhomboidal, with deeply-toothed lower segments. *sori* lateral, one to four to a pinnule, the tube small, more or less exserted; receptacle slender, elongated. Europe (Britain). Hardy. SYN. *T. brevisetum*.

T. r. Andrewsii (Andrews'). *fronds* deep green, narrow-lanceolate; pinnæ more distant than in the species, narrower and erect. A distinct and handsome, hardy, Irish variety.

T. r. dilatatum (dilated). *fronds* very dark green, much less divided than in the type; pinnæ and pinnules broadly winged. Hardy.

T. r. Luschnatianum (Luschnat's). *fronds* lanceolate, acuminate, quite sessile. Brazil. Stove.

T. reniforme (kidney-shaped). *sti.* 4in. to 8in. long, naked, wiry. *fronds* orbicular-reniform, entire, with a deep sinus at the base, 2in. to 4in. broad. *sori often encircling* the whole of the outer margin; receptacle much exserted, stout, and covered with capsules. New Zealand. Greenhouse.

T. reptans (creeping). *sti.* ¼in. long. *fronds* ¼in. to ½in. each way, obovate-cuneate, often with short, blunt lobes. *sori* one to four, placed on the outer margin, the tube partially or quite exserted, the mouth distinctly two-lipped. Tropical America. This is very closely allied to *T. punctatum*.

T. rhomboideum (rhomboid). A synonym of *T. javanicum*.

T. rigidum (rigid).* *sti.* tufted, erect, wiry, 2in. to 8in. long, naked or very slightly winged above. *fronds* 2in. to 8in. long, 2in. to 6in. broad, deltoid or ovate, acuminate, tri- or quadri-pinnatifid, the main rachis usually only slightly winged towards the top; lower pinnæ 2in. to 3in. long, erecto-patent, ovate or lanceolate-rhomboid, cut down to a rachis which is very narrowly winged throughout or free below; pinnules deeply pinnatifid, with deeply-toothed or even pinnatifid, linear lobes. *sori* two to twelve to a pinnule, small, axillary, the tube more or less exserted. New Zealand, &c. Stove or greenhouse. SYNS. *T. achilleæfolium*, *T. obscurum*.

T. r. elongatum (lengthened). *fronds* deltoid, with broader segments; pinnæ and pinnules often imbricated.

T. rufum (reddish). *sti.* (and under side of the fronds) most profusely covered with long, rufous, woolly hairs. *fronds* pale green above, about 10in. long and 1½in. broad, pinnate; pinnæ

Trichomanes—*continued.*

overlapping each other, the veins exserted at their tips. Demerara. A very rare, distinct, erect-growing Fern.

T. saxatile (rock-loving). *sti.* terete, hairy. *fronds* tufted, triangular-ovate, pinnate below; pinnæ bipinnatifid, the upper ones decurrent; pinnules ovate, the margins more or less decurved, giving the surface a pretty, undulating character; ultimate segments broad, short, obtuse-pointed. Involucres cylindrical, supra-axillary, slightly two-lipped. Borneo, 1862. A dwarf but very pretty species.

T. scandens (climbing). *rhiz.* wiry, wide-creeping. *sti.* strong, erect, naked, 2in. to 4in. long. *fronds* 6in. to 18in. long, 3in. to 6in. broad, fully pinnate, or the hairy rachis very slightly winged above, ovate, acuminate; lower pinnæ ovate-lanceolate, nearly pinnate, 2in. to 4in. long; pinnules divided down to a narrow wing; segments again pinnatifid about half-way down; margins finely hairy. *sori* one to four to a pinnule, the mouth with two lateral projections. Mexico, &c., 1862.

T. Sellowianum (Sellow's). *sti.* clothed with short hairs. *fronds* bright green, linear-lanceolate, deeply pinnatifid; segments oblong, obtuse, waved at the edges, where there are a few hairs. Brazil. An extremely rare plant in cultivation.

T. setigerum (bristle-bearing). *sti.* quite terete, 2in. to 6in. long, furnished with hair-like scales. *fronds* tufted, 9in. to 15in. long, linear or linear-lanceolate, pinnate, smooth, curving; pinnæ bipinnatifid; pinnules palmate; ultimate segments elongated and very narrow, almost capillary, the lower ones incurved, sub-erect. Involucres supra-axillary, small, sub-cylindrical, terminal on a narrow segment. Borneo, 1862.

T. sinuosum (waved). *rhiz.* wide-creeping, sinuous, rather strong. *sti.* varying from hardly any to 2in. long. *fronds* 2in. to 9in. long, 1in. to 1½in. broad, linear-lanceolate, very gradually decurrent below, pinnatifid down to a broadly-winged rachis; lobes oblong, obtuse, crenate-margined. *sori* two to four to each lobe; receptacle much exserted. Tropical America. SYN. *T. incisum.*

T. spicatum (spicate). *cau.* erect, tufted. *barren fronds* 4in. to 6in. long, 1in. to 1½in. broad, on stipes 1in. to 2in. long, pinnatifid nearly to the rachis, the apex not rooting; segments inciso-crenate, linear-oblong. *fertile fronds* composed of a rachis and two rows of sori, without any connecting membrane. West Indies. (H. G. F. 60.) SYN. *Feea polypodina.*

T. superbum (superb). *rhiz.* strong, wide-creeping. *sti.* 2in. to 5in. long, strong, winged nearly down to the base. *fronds* 4in. to 9in. long, 2in. to 4in. broad, broadly ovate, pinnatifid down to a narrowly-winged rachis; lower pinnæ lanceolate, divided more than half way to the rachis, with oblong, crenate lobes. *sori* two to six to each lobe; receptacle long, filiform. Trinidad, 1863. SYN. *T. fimbriatum.*

T. tenerum (slender). *rhiz.* creeping, tomentose, very slender. *sti.* 1in. to 2in. long, slender, naked. *fronds* 3in. to 8in. long, 1in. to 1½in. broad, pendent, flaccid, lanceolate, tripinnatifid, the main rachis only very slightly winged towards the apex; pinnæ distant, flaccid, cut down to a narrowly-winged rachis, with distant, deeply-incised or pinnatifid pinnules; ultimate segments about two lines long. *sori* one to four to a pinna, the tube more or less exserted. Tropical America. SYN. *T. angustatum.*

T. trichoideum (hair-like).* *rhiz.* creeping, slender. *sti.* 1in. to 2in. long, very slender, naked. *fronds* 4in. to 8in. long, 1in. to 2in. broad, pendent, flaccid, lanceolate, tripinnatifid, the main rachis only slightly winged at the apex; pinnæ flaccid, 1in. to 2in. long, the rachis only winged above; pinnules deeply cut, with distant, linear-filiform segments one to two lines long. *sori* one to four to a pinna, the tube exserted, sometimes stalked. West Indies, 1862.

T. trichophyllum (hair-fronded). *sti.* densely tufted, wiry, terete, 1in. to 2in. long. *fronds* 2in. to 4in. long, 1in. to 1½in. broad, oblong, decompound; rachis stiff, terete throughout; pinnæ twelve to fifteen-jugate, much imbricated, many of them deltoid, ½in. broad; lower pinnules copiously pinnatifid; ultimate divisions bristle-like, ⅛in. to ¼in. long, spreading in all directions. *sori* copious, free, placed near the base of the pinnules on the upper side. Borneo and New Caledonia, 1862.

T. venosum (veined). *rhiz.* slender, wide-creeping. *sti.* 1in. to 2in. long, very slender, naked. *fronds* 2in. to 5in. long, 1in. to 1½in. broad, pinnatifid, the main veins free in the lower half, broadly winged above; lower pinnæ about 6in. long, varying from linear and nearly simple to lanceolate and deeply pinnatifid below. *sori* only one to a pinna, axillary on the upper margin, the tube slightly two-lipped. Australia and New Zealand. Greenhouse.

TRICHONEMA. A synonym of *Romulea.*

TRICHOPETALUM (from *thrix*, *trichos*, a hair, and *petalon*, a petal; the inner perianth segments are fringed). ORD. *Liliaceæ.* A monotypic genus. The species is a curious, half-hardy, perennial herb, with a thick rhizome, and fascicled, fleshy or tuberous root fibres. A light, rich soil is most suitable. The plant succeeds in a pit, or in an effectively-drained frame, with a southern aspect. It will also thrive in pots, if ample drainage be afforded. Propagation may be effected by divisions.

FIG. 95. TRICHOPILIA SUAVIS.

Trichopetalum—*continued.*

T. gracile (slender). A synonym of *T. stellatum*.

T. stellatum (star-like). *fl.*, perianth greenish, six to seven lines long, the outer segments keeled, the inner ones densely bearded; pedicels ascending; raceme straight, rather loose, few-flowered, simple or slightly forked, 3in. to 6in. long; scape 6in. to 12in. long, with one to three bracts (reduced leaves). Early summer *l.* six to eight, narrow-linear, glabrous, Grass-like, 4in. to 12in. long. *h.* 1ft. to 3ft. Chili, 1828. SYNS. *T. gracile* (B. R. 1535), *Anthericum plumosum* (B. M. 3084). The correct name of this plant is *Bottionea thysanotoides*.

TRICHOPHORUM. Included under *Eriophorum*.

TRICHOPHYLLUM. A synonym of **Bahia** (which *see*).

TRICHOPILIA (from *thrix*, *trichos*, a hair, and *pilion*, a cap; the anther is concealed below a cap surmounted by three tufts of hair). SYNS. *Leucohyle*, *Pilumna*. Including *Helcia*, *Oliveriana*. ORD. *Orchideæ*. A genus embracing about sixteen species of beautiful, greenhouse, epiphytal Orchids, inhabiting the warmer parts of America. Flowers showy, pedicellate; sepals sub-equal, free, narrow, erecto-patent, often twisted; petals similar; lip with the claw adnate to the column, which it closely invests above, the limb spreading, the slightly-dilated lateral lobes connivent, the middle one continuous and undulated; pollen masses two, obovoid-oblong, exappendiculate; bracts small; scapes springing from a short rhizome, leafless, few-sheathed, one, two, or rarely three to five, flowered. Leaf fleshy, erect, complicated at base, narrow or rather broad. Pseudobulbs one-leaved. Trichopilias may be grown in pots, or in hanging baskets; in the latter their flowers are seen to the best advantage. The plants should be kept well elevated above the rims of the pots or baskets, in order that good drainage may be insured; the flower scapes also proceed from beneath the leaves and pseudobulbs. Fibrous peat and living sphagnum, with some pieces of charcoal intermixed, afford a suitable compost. A moderate supply of water should be given during the growing season, but very little is requisite in winter; still, the plants must not be allowed to suffer for want of it. Trichopilias in good health blossom very freely; the plants succeed best in the Mexican house. Sickly specimens—the result of growing in too high a temperature — are frequently met with. Propagated by carefully-made divisions.

T. albida (whitish). *fl.*, sepals and petals pale greenish-yellow, nearly straight, the margins slightly hyaline; lip longer than the petals, four-lobed; the lobes whitish, the throat with scattered, ochraceous-yellow dots; hood trilobed; raceme pendulous, about three-flowered. *l.* oblong-lanceolate, flat, sub-cordate at base, acuminate at apex, recurved. Caraccas, 1851.

T. Backhousiana (Backhouse's). *fl.* more fleshy than in *T. fragrans* (which this species closely resembles); lip much narrower and lobed near each end, but twice as broad in the middle as that of *T. fragrans*. *l.* faintly spotted and clouded with darker patches. New Grenada, 1876. Whole plant paler green than *T. fragrans*.

T. coccinea (scarlet). A garden synonym of *T. marginata*.

T. crispa (curled).* *fl.*, sepals and petals light cherry-crimson, faintly edged with white, the margins crispate-crenate; lip white outside, somewhat deeper in colour than the sepals, large, the margin irregularly crisped, the throat rich deep

Trichopilia—*continued.*

crimson. April to June. Central America, 1857. A charming and rare species, resembling *T. marginata*.

T. c. marginata (margined). *fl.* large and very showy; sepals and petals pale purplish-red, white at the edges; lip white externally, the central lobe dull crimson, the throat of a darker and richer crimson, the limb narrowly edged with white. (F. d. S. 1925-6; W. S. O. i. 5.)

T. fragrans (fragrant).* *fl.* deliciously sweet-scented; sepals and petals pale yellowish-green, 2½in. to 3in. long, wavy, and slightly twisted; lip pure white, orange-spotted towards the base; racemes pendent, three or four together. Winter.

FIG 96. FLOWER OF TRICHOPILIA SUAVIS (natural size).

l. broadly oblong-lanceolate. Pseudo-bulbs oblong, 4in. to 6in. long, slightly compressed. New Grenada, 1858. SYN. *Pilumna fragrans* (B. M. 5035).

T. fragrans (fragrant). A garden synonym of *T. nobilis*.

T. Galeottiana (Galeotti's).* *fl.*, sepals and petals cuneate-lanceolate, acute, the latter somewhat broader, pale green, with a central bar of olive-brown; lip closely folded round the column, the front lobe obreniform, the disk pale yellow, with bars and lines of crimson-purple, the margin passing to white; peduncles one-flowered. August and September. *l.* cuneate-oblong, acute, dark green. Pseudo-bulbs tall, ligulate, ancipitous. Mexico, 1860. SYNS. *T. picta* (I. H. 225), *T. Turialvæ*, of Bateman (B. M. 5550).

T. grata (pleasing). *fl.* sweetly-scented; sepals and petals yellowish-green; lip expanded, white, blotched with yellow on each side of the keel; racemes few-flowered. *l.* oblong-ligulate. Pseudo-bulbs elongated, ancipitous, two-leaved. Peru, 1868. This species is allied to *T. fragrans*.

T. hymenantha (membrane-flowered). *fl.* white, small; sepals

Trichopilia—*continued.*

and petals slightly twisted; lip sessile, nearly flat, with erose edges, speckled with deep sanguineous-purple towards the base and sides; racemes six to eight-flowered, drooping. Summer. *l.* thick, fleshy, elongated-ensiform, acuminate, narrowed to the base, the lower part representing a stem or pseudo-bulb. New Grenada, 1854. (B. M. 5949; R. X. O. i. 7.)

T. Kienastiana (Kienast's). *fl.* white, with a few yellow lines or spots on the disk of the lip; sepals and petals linear-ligulate; lateral lobes of lip median, obtuse-angled; anterior lobes porrected, wavy, emarginate; peduncle usually two-flowered. *l.* and pseudo-bulbs much like those of *T. suavis.* Habitat unknown. 1883.

T. lepida (pretty). *fl.* handsome, 4in. to 5in. in diameter; sepals and petals pale rosy-lilac, irregularly margined with white; lip prominent, fimbriated, in front deep purple-crimson with an irregular margin of white; peduncles deflexed. Spring. *l.* oblong-ovate, acute, leathery. Pseudo-bulbs oblong, obtuse, ancipitous. Costa Rica, 1873. (F. M. ser. ii. 98; W. O. A. v. 197.)

T. marginata (margined).* *fl.* 4in. to 5in. across; sepals and petals brownish-red, with greenish-yellow margins, narrow, once twisted; lip white outside, the mouth three-lobed, the lateral lobes roundish and the central ones emarginate, wavy, reddish-purple, sometimes edged with white, becoming deep crimson in the throat, or with the limb white and the throat only deep crimson; peduncles drooping, one-flowered. May and June. *l.* lanceolate, shortly acuminate, recurved at tip. Pseudo-bulbs clustered, oblong, furrowed, recurved at tip. Central America, 1880. (G. M. B. iii. 185.) SYN. *T. coccinea* (B. M. 4857; L. J. F. 184; L. & P. F. G. ii. 54).

T. m. flaveola (yellowish). *fl.*, sepals and petals greenish-yellow; lip and column white. 1880.

T. mutica (beardless). *fl.* dirty-white, slightly tinged with red; sepals and petals linear, acute; lip parallel with the column, cordate-ovate, cucullate at base; raceme few-flowered, weak. August. *l.* linear-lanceolate, convex at back. Said to be a native of Trinidad, 1821. SYN. *Macradenia mutica.*

T. nobilis (noble).* *fl.* larger than those of *T. fragrans*, sweet-scented; sepals and petals white, undulated; upper lobes of lip rounded and meeting over the throat, the front one pure snow-white, 1¼in. broad, having on each side of the throat an orange-coloured blotch, the two blotches meeting to form a central, eye-like spot; scapes erect, four or five-flowered. *l.* broadly oblong, acute. Pseudo-bulbs elongated, oblong, compressed, clustered. Columbia. A beautiful species, perhaps a variety of *T. fragrans* (under which name it is figured in F. M. ser. ii. 21, I. H. ser. iii. 94, and W. O. A. iii. 128).

T. picta (painted). A synonym of *T. Galeottiana.*

T. rostrata (beaked). *fl.*, sepals and petals pale whitish-green, linear, acute, the petals twice twisted; lip white, with pale orange rays, flabellate, trifid towards the apex; peduncle two-flowered. *l.* broadly ligulate, acute. Pseudo-bulbs linear-lingulate, the basilar scales slightly dotted. New Grenada, 1872.

T. sanguinolenta (dark-bloody). *fl.* rather showy, 2½in. across; sepals and petals yellowish-olive, marked with transverse bands or ocellate markings of brownish-crimson; lip emarginate, recurved, white, flabellately veined, the veins in the basal half marked out by broken lines of crimson. *l.* undulated, petiolate, 4in. to 6in. long. Pseudo-bulbs ovate, elongated. Ecuador, 1843. SYN. *Helcia sanguinolenta* (I. H. ser. iii. 21; L. & P. F. G. ii. 182).

T. suavis (sweet).* *fl.* white or creamy-white, delicately Hawthorn-scented; sepals and petals narrowed to the base, scarcely twisted; lip yellow in the throat, spotted with pale violet-rose on the front part and on the sides, closely rolled up at the base, spread out in a funnel-shaped form, three-lobed in front; peduncles three or four-flowered. March and April. *l.* large, broad-oblong, acute, wavy, nearly sessile. Pseudo-bulbs oblong-obcordate, ancipitous, clustered. Costa Rica, 1850. A fine species. See Figs. 95 and 96. (B. M. 4654; F. d. S. 761; L. J. F. 227; L. & P. F. G. i. 11; W. S. O. iii. 8.)

T. s. alba (white). *fl.*, sepals and petals pure white; lip white, marked in the throat with a yellow stain. May and June. (W. O. A. i. 11.)

T. s. grandiflora (large-flowered). *fl.* more highly coloured than in the type, and expanding better; sepals and petals white; lip upwards of 3in. in diameter, white, with large, rich crimson spots, the throat deep orange. *l.* (as well as the pseudo-bulbs) very large. A lovely variety.

Trichopilia—*continued.*

T. tortilis (twisted). *fl.* drooping, large and attractive; sepals and petals yellowish-green, with lurid brownish-purple blotches along the middle part, spirally twisted, narrow-lanceolate; lip white outside, yellowish-white or white within, thickly spotted with rose-colour and blotched with yellow about the throat, the base closely rolled in, the front part spreading out and three-lobed; peduncle one-flowered. *l.* oblong, acute. Pseudo-bulbs oblong or ligulate, compressed, 2in. to 4in. long. Mexico, 1835. An interesting species. See Fig. 97. (B. iii. 122; B. M. 3739;

FIG. 97 FLOWER AND LEAF OF TRICHOPILIA TORTILIS.

B. R. 1863.) There are several varieties of this species. One — *candidum* — has white, and another brighter-coloured, flowers.

T. Turialvæ (Turialva), of Bateman. A synonym of *T. Galeottiana.*

TRICHOPTERIS. Included under *Alsophila.*

TRICHOS. A term, used in Greek compounds, signifying hair-like or hairy; *e.g.*, *Trichocentron*, *Trichomanes.*

TRICHOSACME (from *thrix*, *trichos*, a hair, and *acme*, a point; referring to the corolla's hairy appendage). ORD. *Asclepiadeæ.* A monotypic genus. The species is a stove, climbing shrub, densely white-woolly on all parts except the corolla. For culture, *see* **Stapelia.**

T. lanata (woolly). *fl.* purple, mediocre or rather small, six to ten in umbelliform cymes; calyx of five lanceolate segments; corolla with a short, rotate tube, the lobes emarginate, the teeth produced in a long, filiform appendage; peduncles opposite the leaves. July. *l.* opposite, petiolate, cordate at base, elliptic or oblong, obtuse or slightly acute. Mexico, 1850. (F. d. S. 1123; L. & P. F. G. i. 105.)

TRICHOSANTHES (from *thrix, trichos*, a hair, and *anthos*, a flower; alluding to the fringed corolla). Snake Gourd. Including *Eopepon*. ORD. *Cucurbitaceæ*. A genus comprising about thirty species of stove, greenhouse, or half-hardy, climbing, annual or perennial herbs, sometimes shrubby at base, occasionally tuberous-rooted; they are found in tropical Asia, North Australia, and Polynesia. Flowers white, diœcious, less often monœcious; calyx long-tubular, with five lanceolate, entire, serrated, or torn segments; corolla five-cleft nearly to the base, the lobes long-fringed. Stamens of the males three; peduncles usually in axillary pairs, one one-flowered and

FIG. 98. TRICHOSANTHES ANGUINA, showing Portion of Stem, with Fruit and Male Flowers, and detached Cluster of Flowers.

Trichosanthes—*continued.*

caducous, the other racemose; bracts occasionally wanting. Female flowers solitary; ovary inferior, at the base of the calyx tube, one-celled, the style three or six-cleft at apex. Fruit lanceolate or globose, smooth, often large. Leaves entire or three to nine-lobed, denticulate; tendrils usually two or three-cleft. The common name of *T. anguina* refers to its fruits, which are eaten as a vegetable in India. Seeds of the species here described should be sown on a hotbed, in spring, and the plants afterwards treated like Cucumbers.

T. anguina (snake-like).* Common Snake or Viper Gourd; Serpent Cucumber. *fl.*, calyx tube 1in. long; the earlier male peduncle occasionally replaced by a female. *fr.* elongated, cylindrical, sometimes twisted, edible. *l.* cordate-sub-reniform, three to seven-lobed or five-angular; lobes pubescent or puberulous on both surfaces, not acuminate. Stems twining, more or less pubescent. India, &c., 1735. Half-hardy. See Fig. 98. (B. M. 722.) SYN. *T. colubrina* (B. R. xxxii. 18).

T. colubrina (snake-like). A synonym of *T. anguina*.

T. japonica (Japanese). *fl.*, male racemes few-flowered; bracts large, broadly ovate, deeply subulate-toothed; peduncle robust, sulcate. *fr.* ovoid, slightly acute at base and apex. *l.* membranous, broadly ovate, glabrous and smooth, three to five-lobed; lobes triangular, acute, entire or undulate-denticulate on the margins. Stem slender. Japan, 1872. Greenhouse. (R. G. 714.)

T. Kirilowii (Kirilow's). *fl.* diœcious; male racemes few-flowered at apex, the bracts acutely toothed. *fr.* ovoid or ovoid-oblong. *l.* sub-orbicular, often deeply palmately five to seven-lobed; lobes oblong or oblong-lanceolate, acute, deeply incised-serrated or lobulate. Stem annual, branched. Root perennial. China, 1872. Greenhouse. SYN. *Eopepon vitifolius*.

T. palmata (palmate-leaved).* *fl.*, male racemes on long, stout peduncles, at first short and head-like, at length elongated, with a toothed or jagged bract, at least 1in. across, under each pedicel; female flowers shortly pedicellate. *fr.* nearly globular, 2in. to 3in. in diameter. *l.* broad, palmately three to seven-lobed, pubescent. India and North Australia, 1825. Stove. (B. M. 6873.)

T. tuberosa (tuberous-rooted). *fl.*, corolla white, the tube intimately united and incorporated with the tube of the calyx; limb free, of five long, deeply bifid segments, the divisions forked at the extremity. September. *l.* distant, formed of three deeply-cut, linear-oblong, divaricating lobes, acute at the points, the lower ones with a smaller, unidentate lobe at the base. Stems green, climbing. Root a large, rounded tuber. West Indies. Stove. (B. M. 2703.)

TRICHOSMA (from *treis*, three and *chosma*, a division; in allusion to the three-lobed labellum). ORD. *Orchideæ*. A monotypic genus. The species is a very distinct and scarce, stove, epiphytal Orchid. It may be grown in a well-drained pot or pan of fibrous peat and sphagnum. When in active growth, it must be kept moderately moist; and, as it has no fleshy pseudo-bulbs, it must never be allowed to get quite dry.

Trichosma—*continued.*

T. suavis (sweet). Hair Orchid. *fl.* fragrant, rather large, in a short, terminal raceme; sepals and petals creamy-white, lanceolate; lip three-lobed, the side lobes white, striped with brownish-crimson, the middle one undulated, recurved, yellow, margined with crimson, and bearing several crispy crests on the disk. Spring. *l.* two, broadly lanceolate, obsoletely three-nerved. Stems thin, tufted, terete, 8in. to 10in. high. Khasya Mountains, 1840. (B. R. 1842, 21; W. O. A. iii. 114.) SYNS. *Cœlogyne coronaria, Eria coronaria, E. suavis*

TRICHOSORUS. Included under *Alsophila.*

TRICHOSPORUM. A synonym of **Æschynanthus** (which *see*).

TRICHOSTEMA (from *thrix, trichos,* hair, and *stema,* stamen; referring to the capillary filaments). Blue Curls. ORD. *Labiatæ.* A genus comprising about half-a-dozen species of hardy, North American herbs. Flowers commonly blue or violet, in axillary, dense or loose, many-flowered whorls. Leaves entire; floral ones conformed. Two of the species have been introduced, but they are probably not now in cultivation.

FIG. 99. FLOWERING BRANCH OF TRICUSPIDARIA HEXAPETALA.

TRICHOTOMOUS. Branching in threes.

TRICLISSA. A synonym of **Kniphofia** (which *see*).

TRICOCCUS. A fruit consisting of three cocci, or elastically-dehiscing shells.

TRICOLOR. Three-coloured.

TRICONDYLUS. A synonym of **Lomatia** (which *see*).

TRICORYNE (from *treis*, three, and *koryne*, a club; in allusion to the form of the capsules). ORD. *Liliaceæ*. A genus embracing six species of greenhouse perennials with fibrous roots, limited to Australia. Flowers in terminal umbels, with small, imbricated, scarious bracts; perianth spirally twisted after flowering, but at length deciduous, of six narrow, three or five-nerved segments; stamens six, hypogynous. Leaves few and Grass-like or all reduced to scarious scales. Stems usually wiry and branching, the branches often clustered. It is doubtful whether any of the species are in cultivation. *T. elatior* thrives in light, rich soil, and may be increased by divisions.

T. elatior (taller). *fl.*, perianth white, usually about ½in. long; umbels three, four, or six-flowered. June. *l.*, lower ones often Grass-like, 2in. to 4in. long, the upper ones, and sometimes all, reduced to short scales. Stem 1ft. to 2ft. high. 1824.

TRICRATUS. A synonym of **Abronia** (which *see*).

TRICUSPIDARIA (from *tricuspis*, three-pointed; alluding to the petals). SYN. *Tricuspis*. ORD. *Tiliaceæ*. A small genus (two species) of Chilian, greenhouse trees. Flowers rather large; calyx campanulate, truncate, obsoletely five-toothed, afterwards cut and deciduous; petals five, three-toothed or three-lobed, induplicate-valvate; stamens numerous, inserted above the torus; peduncles axillary, solitary, one-flowered. Leaves alternate and opposite, serrated. *T. hexapetala*, the only species introduced, is a very beautiful, greenhouse shrub. For culture, *see* **Correa.**

T. hexapetala (six-petaled). *fl.* red, on long peduncles. Capsule sub-rotund, silky-pilose. *l.* oblong-lanceolate, serrated or rarely entire. See Fig. 99. (Gn., Nov. 1880, under name of *Crinodendron Hookerianum.*)

TRICUSPIS (of Palisot de Beauvois). Included under **Triodia** (which *see*).

TRICUSPIS (of Persoon). A synonym of **Tricuspidaria** (which *see*).

TRICYRTIS (from *treis*, three, and *kyrtos*, convex; alluding to the three outer perianth segments having bags at their base). SYNS. *Compsanthus*, *Compsoa*. ORD. *Liliaceæ*. A small genus (five species) of half-hardy perennials, with shortly-creeping rhizomes, natives of the Himalayas, Japan, and China. Flowers few, rather large, on longish pedicels; perianth often elegantly spotted within, campanulate; segments distinct from the base, lanceolate, the outer ones saccate at base, the inner ones flat, all spreading above; stamens six, hypogynous; inflorescence terminal or in the upper axils, loosely dichotomous, erect. Leaves alternate, ovate or oblong, contracted, sub-sessile, or cordate-amplexicaul at base. Stem erect, simple below the inflorescence, leafy. The three species introduced are ornamental plants. They thrive in a compost of sandy loam and peat, and require the shelter of a greenhouse or cold pit in winter. Propagation may be effected by offsets.

T. elegans (elegant). A synonym of *T. pilosa*.

T. hirta (hairy).* Japanese Toad Lily. *fl.* six to fifteen, racemose or sub-corymbose; perianth nearly 1in. long, the segments white, the outer ones decorated with large, purple dots. May. *l.* oblong, cuspidate, cordate-amplexicaul, 4in. to 6in. long, slenderly pilose. Stem 1ft. to 3ft. high, clothed with soft, white, slightly spreading pili. Japan, 1863. See Fig. 100. (B. M. 5355.)

T. macropoda (large-footed).* *fl.* on pedicels ½in. to ¾in. long, disposed in a loose corymb; perianth whitish-purple, with minute, purple dots, nine to ten lines long. May. *l.* oblong, acute, 4in. to 5in. long, 1½in. to 2in. broad, sessile or very shortly petiolate, rounded at base, glabrous above, pubescent beneath. Stem 2ft. to 3ft. high. Japan and China, 1869. (B. M. 6544; R. G. 613.)

T. m. striata (striped). A pretty plant, having leaves striped with white. (F. d. S. 1820, under name of *T. foliis albo-striatis.*)

FIG. 100. TRICYRTIS HIRTA, showing Habit, and Portion of Stem, with Flower.

T. pilosa (pilose). *fl.* many, loosely corymbose; perianth eight to nine lines long, the segments whitish, marked with large, purple spots. May. *l.* oblong, cuspidate, cordate-amplexicaul, 4in. to 6in. long, slenderly pilose. Stem 2ft. to 4ft. high, pilose. Himalayas, 1851. (B. M. 4955; F. d. S. 1219.) SYN. *T. elegans*.

TRIDAX (from *Thridax*, the old Greek name used by Dioscorides for the Lettuce, from *treis*, three, and *akis*, a point; alluding to the ray florets). SYNS. *Balbisia* (of Willdenow), *Bartolina*. Including *Galinsogea* and *Ptilostephium*. ORD. *Compositæ*. A genus embracing seven species of hardy, perennial herbs, natives of tropical America. Flower-heads yellow, or the disk greenish, mediocre, long-pedunculate, heterogamous; ray florets ligulate or sub-bilabiate, the outer lip large, sometimes three-toothed, three-cleft, or three-parted, the inner smaller or minute, two-lobed or two-parted, sometimes obsolete; involucral bracts in few series; receptacle flat or convex; achenes turbinate, silky-villous. Leaves opposite, incised-toothed or pinnately dissected; segments few, narrow. The species possess but little beauty, and require ordinary culture. Propagated by divisions, or by seeds.

T. coronopifolium (Coronopus-leaved). *fl.-heads* yellow; ray florets unequally five-lobed; outer involucral scales obtuse or mucronate. June. *l.* variously pinnatifid or trifid; lobes linear, acute. *h.* 1ft. Mexico. SYN. *Ptilostephium coronopifolium.*

T. trilobata (three-lobed). *fl.-heads* yellow; ray florets five-toothed; pappus bristles very short and scarcely pinnately lobed, or longer and plumose-fimbriate; peduncles pubescent or glandular-puberulous at apex. June. *l.* three-lobed or pinnately incised. *h.* 1ft. Mexico. SYN. *Galinsogea trilobata* (B. M. 1895; S. B. F. G. 56).

TRIDENS. Included under **Triodia** (which *see*).

FIG. 101. TRIDENTATE LEAF.

TRIDENTATE. Trident-pointed. A Tridentate leaf is shown at Fig. 101.

TRIDENTEA. Included under **Stapelia** (which *see*).

TRIDIA. Included under **Hypericum** (which *see*).

TRIENTALIS (a Latin term, signifying one-third of a foot in height; in reference to the stature of the plants). Chickweed Wintergreen. ORD. *Primulaceæ.* A small genus (two species) of highly glabrous, hardy herbs, with creeping, perennial rhizomes; one is found in Europe, North Asia, and North-west America. Flowers white; calyx five to nine-parted, persistent; corolla hypogynous, rotate, five to nine-parted, the tube very short, the segments elliptic-lanceolate; stamens five to nine; peduncles one to three, one-flowered, filiform, ebracteate. Leaves usually as many as the petals, somewhat whorled, obovate-elliptic or lanceolate, entire. Stems solitary, slender, erect. These pretty little plants require a light, rich soil and a shady situation. Propagated, in spring, by seeds, covered with a handlight; or by divisions.

T. americana (American). Star Flower. *fl.*, divisions of the corolla finely acuminate. May. *l.* lanceolate, acuminate at both ends. Stem very naked below, unequally five to nine-leaved at the summit, 9in. high. North-west America, 1816.

FIG. 102. TRIENTALIS EUROPÆA, showing Habit and detached Flower.

T. europæa (European). *fl.* few, erect; corolla ½in. to ¾in. in diameter, the lobes ovate, acute. June and July. *l.* obovate or obovate-lanceolate, 1½in. to 2½in. long, shining, rigid, obtuse or acute, narrowed into short petioles. Stem wiry, slender, leafy at top, 4in. to 8in. high. Europe (Britain), &c. See Fig. 102. (L. B. C. 105; Sy. En. B. 1139.)

TRIFARIOUS. Arranged in a triple rank, or in three rows.

TRIFID. Split half-way into three parts.

TRIFOLIOLATE. Bearing three leaflets from the same point; *e.g.*, Clover.

TRIFOLIUM (from *tres*, three, and *folium*, a leaf; most of the species have trifoliolate leaves). Clover; Trefoil. Including *Lupinaster* and *Pentaphyllon.* ORD. *Leguminosæ.* A large genus (nearly 280 species have been described, of which, probably, not more than 150 are really distinct) of hardy, annual or perennial herbs, copiously dispersed over the temperate and sub-tropical regions of the Northern hemisphere, a few being also found in the mountains of tropical America, Africa, and extra-tropical South America. Flowers often purple, red, or white, rarely yellow, spicate, capitate, umbellate, or rarely solitary; calyx teeth or lobes sub-equal, or the

Trifolium—*continued.*

lower ones longer; petals often marcescent, all long-clawed, or the four lower ones more or less adnate with the staminal tube; standard oblong or ovate; wings narrow; keel shorter than the wings, obtuse; stamens diadelphous. Pod oblong and sub-terete, or obovate-compressed, indehiscent. Leaves digitately three, rarely five or seven, foliolate, sometimes pinnately three or very rarely five-foliolate; stipules adnate with the petioles. This genus embraces several important fodder-plants. Eighteen species are included within the British Flora, viz., *T. arvense* (Hare's-foot Clover), *T. Bocconi*, *T. filiforme* (Yellow Suckling Clover), *T. fragiferum* (Strawberry Clover), *T. glomeratum*, *T. incarnatum* (Crimson or Carnation Clover), *T. maritimum*, *T. medium* (Cow Grass; Meadow or Zigzag Clover), *T. minus*, *T. ochroleucum*, *T. pratense* (Red or Broad-leaved Clover; Marl-grass), *T. procumbens* (Hop Trefoil), *T. repens* (White or Dutch Clover; Shamrock), *T. scabrum*, *T. striatum* (Knotted Clover), *T. strictum*, *T. subterraneum*, and *T. suffocatum* (Sand Clover); and *T. hybridum* (Alsike or Bastard Clover) has become naturalised. Four-leaved Shamrocks and other Clovers are considered "lucky," as being rare, but are by no means unfrequently met with. Few of the species of *Trifolium* boast of much horticultural merit; the selection given below embraces all that call for description here. All thrive in common garden soil. The annuals and biennials may be increased by seeds, and the perennials by divisions. Except where otherwise stated, the under-mentioned plants are perennials.

T. alpestre (alpine).* Owl-headed Clover. *fl.* purple; lower calyx segment longer than the gamopetalous corolla, the rest short and tooth-like; heads globose. June and July. *l.*, leaflets lanceolate, coriaceous, ciliately serrulated; stipules narrow, nearly sessile, long. Stem erect, simple. *h.* 6in. to 12in. Alps of Europe and Western Asia, 1789. (B. M. 2779.)

T. cæruleum (blue). A synonym of *Trigonella cærulea.*

T. canescens (hoary). *fl.* cream-coloured; calyx smooth, the lowest segment a little longer than the rest; corolla gamopetalous, much longer than the calyx segments; heads terminal, large, oblong, nearly sessile. May and June. *l.*, leaflets obovate, emarginate, villous; stipules lanceolate-subulate. Stems ascending, adpressedly hairy. Cappadocia, &c., 1803. (B. M. 1168.)

T. fimbriatum (fringed). *fl.* purple; calyx teeth spiny, half as long as the slender corolla; heads 1in. in diameter. September and October. *l.*, leaflets oblong or slightly cuneate, 1in. or more in length, conspicuously fringed with spinulose-setaceous teeth. Stems long and thick, prostrate, glabrous. North America, 1825. (B. R. 1070; L. B. C. 1421.)

T. fucatum (painted). *fl.* cream-colour mixed with red; corolla many times longer than the calyx; heads 1in. to 2in. in diameter, somewhat hemispherical, few-flowered; peduncles axillary, mostly longer than the leaves. June. *l.*, leaflets roundish-cuneiform, sharply denticulate, rather thick; stipules large, entire, mucronate. *h.* 6in. California, 1824. Annual. (B. R. 1883.)

T. hybridum (hybrid). Alsike or Bastard Clover. *fl.* white or rosy, ½in. long, drooping; heads axillary, peduncled, globose, ¾in. to 1in. in diameter. June to August. *l.* on long petioles; leaflets obovate or oblong, ½in. to 1½in. long, toothed; stipules oblong, with triangular tips. Stems 2in. to 10in. long, flexuous. Europe, &c. (B. M. 3702.)

T. incarnatum (flesh-coloured). Crimson Clover. *fl.* bright scarlet, ½in. long; calyx hairy; heads peduncled, terminal, ovoid or cylindric, 1in. to 2in. in diameter. June and July. *l.* on short petioles; leaflets broadly obovate or obcordate, ¾in. to 1½in. long; stipules obtuse. Stems rather slender, clothed with spreading hairs. *h.* 1ft. South Europe, 1640. Annual. (B. M. 328.)

T. Lupinaster (Lupinaster).* Bastard Lupine. *fl.* purple, large, the wings and keel paler than the standard; heads pedunculate, bractless, umbellate. June to August. *l.* sessile; leaflets five, linear-lanceolate, sharply toothed, mucronate; stipules broad, acuminate. *h.* 1ft. to 1½ft. Siberia, 1741. (B. M. 879.) *albiflorum* is a white-flowered form.

T. olympicum (Olympic). *fl.* yellowish; calyx hairy; standard very long; spikes oblong, solitary. July. *l.*, leaflets hairy, elliptic-lanceolate, entire; stipules subulate, sheathing. Stem erect, hairy. *h.* 1ft. Mount Olympus, 1817. (B. M. 2790.)

T. reflexum (reflexed). Buffalo Clover. *fl.* handsome; standard rose-red, broadly ovate; wings and keel white; heads sub-umbellate, dense; peduncles about twice the length of the heads. April to June. *l.*, leaflets obovate or obovate-oblong,

Trifolium—*continued.*

sometimes emarginate, crenulate-serrulate; stipules leafy, acuminate. Stem ascending or decumbent, 1ft. to 1½ft. long. North America, 1794. Annual. (B. M. 3471.)

T. rubens (reddish). *fl.* carmine or purple-red; heads peduncled, ovoid, large. Summer. *l.* stalked; leaflets long, narrow; stipules large. Stems erect. *h.* 1ft. Central and South Europe. (R. G. 1886, p. 243.)

T. spadiceum (chestnut-brown). Brown Clover. *fl.* yellow; standard slightly ferruginous, obcordate; heads ovoid, pedunculate. June to August. *l.* stalked; leaflets oblong-ovate, sessile, denticulated; stipules leafy, acuminate. Stem erect, 6in. high. Europe, 1778. (B. M. 557.)

T. uniflorum (one-flowered).* *fl.* axillary, solitary, on short peduncles: corolla very long, the standard blue, the wings and keel purple. May to September. *l.*, leaflets three, ovate, acuminate, toothed, nerved; stipules sheathing, long-acuminate. Stems very short. Syria, &c., 1800. Plant tufted, creeping. (L. B. C. 1382; S. B. F. G. ser. ii. 200.) The form *Sternbergianum* has white flowers.

T. vesiculosum (bladdery-calyxed). *fl.*, reddish; calyx scarious, inflated, the segments subulate, much shorter than the corolla; heads ovate, thick, on long peduncles. June and July. *l.*, leaflets lanceolate, acute, sharply serrulated; stipules narrow, long-acuminate. Stems erect, firm, 9in. high. South Europe, 1805. (B. R. 1408.)

TRIFURCIA (from *tres*, three, and *furca*, a fork; alluding to the three-forked style). The correct name, according to Bentham and Hooker, is *Alophia*. SYN. *Herbertia*. ORD. *Irideæ*. A small genus (three or four species) of pretty, American, stove, greenhouse, or hardy, bulbous plants. Flowers long-pedicellate; perianth tube none; segments free, the three outer ones shortly unguiculate, spreading, obovate or broadly oblong, the three inner ones much smaller, acute, erect or scarcely spreading; filaments connate in a cylindrical tube; spathes narrow. Leaves few. Bulb tunicated. Only two species call for description here. They thrive in a mixture of equal parts loam, peat, and sand. With protection in winter, the plants will succeed in the open border. Propagation may be effected by offsets, or by seeds.

T. cærulea (blue). *fl.*, outer perianth segments having a white claw, dotted with blue, the blade blue, with a deeper-coloured, triangular mark at base; inner segments blue, deeper-coloured in the middle; anthers and stigma short; peduncle shorter than the bracts. April. Texas, 1842. Half-hardy. SYN. *Herbertia cærulea* (B. M. 3862, figs. 3, d, e, f).

T. pulchella (pretty). *fl.*, limb of the outer perianth segments lilac, undulated, the claw pale-yellowish or whitish, dotted with purple; inner segments deeper-coloured in the middle; anthers subulate, exceeding the stigma. July. *l.* 5in. or more long. Buenos Ayres, 1827. Greenhouse. SYN. *Herbertia pulchella* (B. M. 3862, figs. 1, 2; L. B. C. 1547; S. B. F. G. 222).

TRIGLOCHIN (from *treis*, three, and *glochin*, a point; in reference to the three angles of the carpel). Arrow Grass. ORD. *Naiadaceæ*. A genus consisting of about a dozen species of greenhouse or hardy, marsh-loving, erect, scape-bearing herbs, broadly dispersed over mostly temperate and frigid regions. Flowers small or rather large, spicate or shortly pedicellate and racemose, erect, ebracteate and ebracteolate; perianth segments scale-like, three, six, or rarely fewer; stamens six. Leaves elongated, flat or somewhat terete, sometimes swimming. Two species—*T. maritimum* and *T. palustre*—are British plants. *T. bulbosum* is the only one calling for description here. It thrives in pots of loamy soil, the bottoms of which are immersed in water.

T. Barrelieri (Barrelier's). A synonym of *T. bulbosum*.

T. bulbosum (bulbous-rooted). *fl.* purplish, numerous and very variable, pedicellate, disposed in a simple, elongated raceme; scape erect, smooth. October. *l.* semi-cylindric, linear, bilobed, complanate or scarcely channelled above, the outer ones often reduced to sheaths. Rhizome short, more or less tuberous. *h.* 1ft. Europe, Asia Minor, and South Africa, 1806. Greenhouse. (B. M. 1445; L. B. C. 1151.) SYN. *T. Barrelieri*.

TRIGLOSSUM. A synonym of **Arundinaria** (which *see*).

TRIGONAL. Three-angled, and having three plain faces.

TRIGONELLA (from *treis*, three, and *gonu*, an angle; the standard of the flower is flat, while the wings spread, thus imparting a triangular appearance). Fenugreek. Including *Pocockia*. ORD. *Leguminosæ*. A genus comprising nearly fifty species of hardy, often strong-smelling, annual or perennial herbs; one is Australian, and the rest are dispersed over Europe, Asia, and Africa. Flowers yellow, blue, or white, variously disposed; calyx tubular or short, with sub-equal teeth or lobes; petals free of the staminal tube; standard obovate or oblong, sessile or contracted into a broad claw; wings oblong; keel obtuse. Leaves pinnately trifoliolate; stipules adnate with the petioles. Scarcely any of the species are worth growing. The seeds of *T. Fœnum-Græcum* were anciently held in great repute for medicinal and culinary purposes; but their use in medicine is with us confined to veterinary practice. The genus is represented in Britain by *T. ornithopodioides*. Sowing in the open border is all that is required by the under-mentioned species.

T. cærulea (blue). *fl.* in dense, pedunculate heads; petals white, lined with blue. July and August. *l.*, leaflets ovate, the lower ones roundish-ovate, denticulated; stipules lanceolate, toothed at base. Stems erect, 1ft. to 2ft. high. Bohemia and Switzerland, 1562. Annual. SYN. *Trifolium cæruleum* (B. M. 2283).

T. Fœnum-Græcum. Fenugreek. *fl.* white; calyx pilose, the subulate teeth as long as the tube. June to August. *l.*, leaflets obovate, obsoletely toothed; stipules lanceolate-falcate, entire. Stem erect, simple, 1ft. to 2ft. high. South of France, 1597. Annual. (B. M. Pl. 71; S. F. G. 766.)

T. ruthenica (Russian). *fl.* yellow, disposed in racemose heads. June and July. *l.* lanceolate, very obtuse, sharply serrulated; stipules nearly entire. Stems prostrate, ascending, 1½ft. long. Siberia, 1759. Perennial. (L. B. C. 1391.)

TRIGONIA (from *treis*, three, and *gonu*, an angle the fruit is triangular). SYN. *Mainea*. ORD. *Vochysiaceæ*. A genus embracing about twenty-five species of climbing or sarmentose, stove shrubs, natives of Brazil and Guiana. Flowers often small, in terminal panicles or racemes; sepals and petals five each; stamens five to twelve. Leaves opposite, on short petioles; stipules caducous. Three species have been introduced, but are now probably lost to cultivation.

TRIGONIDIUM (from *trigona*, a triangle, and *eidos*, like; alluding to the triangular form of several parts of the plants). ORD. *Orchideæ*. A small genus (seven or eight species have been described) of curious, stove, epiphytal Orchids, inhabiting tropical America. Flowers rather large, shortly pedicellate within spathaceous bracts; sepals sub-equal, connivent or coherent at base in a triquetrous, turbinate tube, free above, spreading; petals similar, but much smaller; lip rising from the base of the column, erect, much shorter than the sepals, the lateral lobes erect, embracing the column, the middle one spreading; pollen masses four; scapes many-sheathed, one-flowered. Stem very short, mostly pseudo-bulbous. A selection of the species known in gardens is given below. They thrive on blocks, or in baskets of peat, fibre, and sphagnum, and like a fairly light position, near the glass.

T. acuminatum (taper-pointed). *fl.* dull straw-colour externally, within elegantly pencilled with rich brown; sepals acuminate, recurved at apex; petals oval-lanceolate, mucronate. *l.* linear, longer than the peduncles. Pseudo-bulbs ovate, acute, sulcate, one-leaved. Demerara, 1834.

T. Egertonianum (Sir P. Egerton's). *fl.* pale liver-colour, dashed and veined with brown; sepals acute, the lateral ones reflexed; petals slightly acute. *l.* narrow, often 1½ft. long, ensiform. Pseudo-bulbs clustered, oval, compressed, two-leaved. Honduras, 1834. A very distinct species.

T. obtusum (obtuse).* *fl.*, sepals reddish-yellow, obovate; petals white, veined with rose, brown at apex, obtuse; lip white, tubercled at back, the lateral lobes red-margined, the middle one yellow in front. *l.* linear-lanceolate. Demerara, 1834. (B. R. 1923.)

T. tenue (slender). *fl.* brownish-purple; sepals reflexed, very acuminate; lip obtuse, glabrous, reflexed at apex; scape erect, slender. *l.* ensiform, very acute, longer than the scape. Pseudo-bulbs oval, compressed, one-leaved. Demerara, 1836.

TRIGONOTHECA. A synonym of **Catha** (which *see*).

TRIGUERA. Included under *Hibiscus.*

TRIGYNOUS. Having three styles.

TRILISA (from *trilix*, triple; in allusion to the divisions of the pappus). ORD. *Compositæ.* A small genus (two species) of hardy, erect, perennial herbs, natives of North America. Flower-heads purplish or white, rather small, paniculate; florets equal, regular, tubular, five-cleft; involucral bracts in two or three series; receptacle flat, naked. Leaves alternate, entire, amplexicaul; radical ones elongated. Only one species calls for description here. It thrives in any moderately good, light soil. Propagation may be effected by divisions, in spring; or by seeds, which are usually sown early in autumn.

T. odoratissima (very odorous). Vanilla Plant. *fl.-heads* bright purple, numerous, pedicellate; involucral scales glandular. September. *l.* thick; radical ones large, obovate-spathulate, tapering at base, often slightly and obtusely toothed; cauline ones oblong, clasping at base, the upper ones small and scattered. Stem 2ft. to 4ft. high, corymbose at top. 1786. The leaves, when bruised, exhale the odour of vanilla. SYN. *Liatris odoratissima* (A. B. R. 633; S. B. F. G. ser. ii. 184).

TRILIX. A synonym of **Prockia** (which *see*).

TRILLIACEÆ. Included under *Liliaceæ.*

TRILLIUM (from *trilix*, triple; alluding to the triple parts of the flowers and leaves). American Wood Lily; Indian Shamrock; Three-leaved Nightshade. ORD. *Liliaceæ.* A genus comprising about a dozen species of hardy, perennial herbs, with short, thick rhizomes, natives of North America and extra-tropical Asia, from the Himalayas, as far as Japan. Flowers solitary, erect, drooping or reflexed, sessile or pedicellate within the leaves; perianth violet, lurid, white, or greenish, persistent; segments distinct, spreading, the three outer ones slender and herbaceous, green or rarely coloured, the three inner ones petaloid, often larger, less spreading, or sometimes recurved; stamens six; style deeply trifid, or three-parted from the base. Berry globose or ovoid, indehiscent. Leaves three, whorled at the apex of the stem, broad, sub-sessile or rather long-petiolate, three to five-nerved and reticulate-penniveined. Stem simple, erect, with a few short, scarious sheaths at base. The species best known to cultivation are here described. All are North American, and have violently emetic roots. A deep, well-drained bed of peaty soil, in a somewhat shady position, is the most suitable for these plants. During summer, a plentiful supply of water is essential. They may be increased, rather slowly, by dividing the roots, or by seeds. *T. grandiflorum* is the best species, and is one of the most desirable hardy plants for all collections.

T. Catesbæi (Catesby's). A synonym of *T. stylosum.*

T. cernuum (drooping). *fl.* small; inner perianth segments white, eight to twelve lines long, oblong-ovate, wavy, recurved, rather longer than the lanceolate outer ones; peduncle usually shorter than the flower. April and May. *l.* broadly rhomboidal, 2in. to 6in. long, abruptly acuminate, shortly petiolate. Stems two or three together, 1½ft. high. 1758. (B. M. 954.)

T. discolor (two-coloured). *fl.*, inner perianth segments dark purple, varying into green, 1½in. to 2in. long, erect, oblong, obtuse, narrowed below; outer ones shorter, lanceolate, spreading. February and March. *l.* sessile, 3in. to 5in. long, ovate-lanceolate to broadly ovate, tapering from near the base to the apex, variegated above with green and brown, or dark purple. Stem stout, solitary, 6in. to 12in. high. 1831. (B. M. 3097.) According to Sereno Watson, the correct name of this plant is *T. sessile Wrayi.*

T. erectum (erect).* Beth-root; Birth-root; Lamb's Quarters. *fl.* 1in. to 1½in. long, spreading, fetid; inner perianth segments dark purple, oval or oblong, rather longer than the lanceolate-ovate outer ones; peduncles 1½in. to 3in. long, at length declined. May. *l.* sessile, broadly rhomboidal, abruptly acuminate, acute at base. Stem solitary, 1ft. high. 1759. See Fig. 103. (B. M. 470; F. d. S. 990; L. B. C. 1838.) SYNS. *T. fœtidum* (G. C. n. s., xix., p. 605), *T. pendulum* (R. G. 656), *T. rhomboideum* (B. 138).

Trillium—*continued.*

T. e. album (white). *fl.*, inner perianth segments greenish-white, or rarely yellowish. (B. M. 1027; L. B. C. 1850.)

T. e. ochroleucum (yellowish-white). *fl.*, inner perianth segments yellowish-white. (B. M. 3250, under name of *T. e. viridiflorum.*)

T. erythrocarpum (red-fruited).* Painted Wood Lily. *fl.* ¾in. to 1in. long; inner perianth segments white, striped with purple at the base, oblong, wavy, much longer than the lanceolate outer ones; peduncle 1in. to 2in. long, erect. April and May. *fr.* red. *l.* ovate, 3in. to 5in. long, long-acuminate, rounded at base, shortly petiolate. Stem solitary, 1ft. high. 1811. (B. M. 3002; L. B. C. 1232; S. B. F. G. 212.)

T. fœtidum (fetid). A synonym of *T. erectum.*

T. grandiflorum (large-flowered).* Wake Robin. *fl.* 2in. long; inner perianth segments white, changing to rose-colour, obovate, much longer and broader than the lanceolate outer ones; peduncle longer than the flower, erect or slightly declined. May. *l.* 3in. to 5in. long, rhombic-ovate, abruptly acuminate, nearly sessile. Stem solitary, 1ft. to 1½ft. high. 1799. A fine plant. (F. d. S. 991; L. B. C. 1349; R. G. 575; B. M. 855, under name of *T. erythrocarpum.*)

T. nervosum (nerved). A synonym of *T. stylosum.*

T. nivale (snowy).* *fl.*, inner perianth segments, white, oblong, obtuse, 1in. long, scarcely wavy, spreading from an erect base, equalling the peduncle; outer ones lanceolate, obtuse. April. *l.* 1in. to 2in. long, oval or ovate, obtuse, rounded at base, distinctly petiolate. Stem 2ft. to 4ft. high. 1879. (B. M. 6449.)

FIG. 103. TRILLIUM ERECTUM.

T. obovatum (obovate). *fl.*, inner perianth segments pink, above 1in. long, elliptic-ovate, obtuse; inner ones shorter, oblong; peduncle erect, 1in. long. April. *l.* sessile, roundish-rhomboid, abruptly acuminate, green above, scarcely paler beneath, glabrous, 2½in. long. Stem erect, 8in. to 10in. high. 1810. This is regarded by Sereno Watson as probably identical with *T. erectum.*

T. pendulum (pendulous). A synonym of *T. erectum.*

T. rhomboideum (rhomboid). A synonym of *T. erectum.*

T. sessile (sessile). *fl.* ten to fifteen lines long, sessile, erect; inner perianth segments dark purple, lanceolate, erect, much longer than the lanceolate, spreading sepals. March and April. *l.* sessile, 1in. to 3in. long, broadly oval, widest in the middle, abruptly pointed, narrowed at base, variegated above with paler and deeper green. Stems slender, 6in. to 12in. high, commonly two or more in a cluster. 1759. (B. M. 40; F. d. S. 2311; L. B. C. 875.)

T. s. Wrayi. *See* **T. discolor.**

T. stylosum (large-styled). *fl.* 1½in. to 2in. long; inner perianth segments tinged with rose-colour, oblong, much longer and broader than the sepals; styles united below the middle; peduncle 1½in. to 2in. long. April and May. *l.* oval or oblong, 4in. long, acute, shortly petiolate. Stem solitary, slender, 1ft. to 1½ft. high. 1823. SYNS. *T. Catesbæi, T. nervosum.*

TRILOBATE. Three-lobed. A Trilobate leaf, with ciliated margins, is shown at Fig. 104.

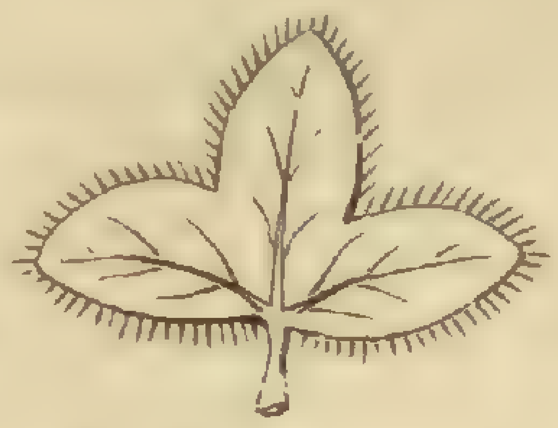

FIG. 104. TRILOBATE LEAF, WITH CILIATED MARGINS.

TRILOCULAR. Three-celled.

TRIMERISMA. A synonym of **Platylophus** (which *see*).

TRIMESTRIS. Existing for three months.

TRIMEZIA (from *treis*, three, and *merizo*, to divide; in allusion to the trimerous division of the flower). SYNS. *Lansbergia, Poarchon, Remaclea, Xanthocromyon.* ORD. *Irideæ.* A genus embracing about half-a-dozen species of stove, bulbous plants, natives of the West Indies and South America. Flowers many in a spathe, pedicellate; perianth tube none, the segments free, shortly unguiculate; stamens opposite the outer perianth segments; spathe solitary, terminal, or two or three at the axils of the floral leaves. Leaves few at the base of the stem, long, flat, and prominently ribbed, sometimes terete and Rush-like; floral one solitary, or the stem wholly leafless. Only one species has been introduced. For culture, *see* **Iris.**

T. martinicensis (Martinique). *fl.* four to six in a cluster; perianth segments bright yellow, very fugacious, the three outer ones ⅝in. to ¾in. long, mottled at the throat, the three inner much smaller; scape equalling the leaves, with a single, reduced, clasping leaf. April. *l.*, radical ones about six, erect, narrow-linear, 1ft. long, three to four lines broad, gradually narrowed to a point. West Indies, &c., 1848. SYNS. *Cipura martinicensis* (Ref. B. 310), *Iris martinicensis* (B. M. 416), *Lansbergia caracasana.*

TRINIA (named in honour of Dr. Karl B. Trinius, 1778-1844, a Russian botanist). ORD. *Umbelliferæ.* A genus embracing seven or eight species of hardy, much-branched, perennial herbs, inhabiting the Mediterranean region and temperate Asia, one—*T. vulgaris*—being a native of Britain. Flowers yellowish or white, in compound, often few-rayed umbels. Leaves pinnately or sub-ternately decompound. The species are of no interest from a garden standpoint.

TRINODAL. Having only three nodes.

TRIODIA (from *treis*, three, and *odous*, teeth; referring to the three-toothed glumes). SYN. *Uralepis* (erroneously spelt *Uralepsis*). Including *Tricuspis* and *Tridens.* ORD. *Gramineæ.* A genus comprising upwards of twenty species of greenhouse or hardy, perennial Grasses, natives of Europe, extra-tropical America, South and sub-tropical Africa, Australia, and New Zealand, a few being also found in tropical America. Spikelets many-flowered, usually erect; glumes rather rigid, one to three-nerved, the two lower ones empty; panicle terminal, narrow or ample. Leaves narrow. *T. decumbens* (Heath Grass) is a native of Britain. Several species have been introduced, but they have no value from a garden standpoint.

TRIŒCIOUS, TRIOICUS. Having male flowers on one individual, females on another, and hermaphrodite on a third.

TRIOLENA (from *treis*, three, and *olene*, the arm; alluding to the three processes from the base of the anthers). ORD. *Melastomaceæ.* A small genus (three species) of nearly glabrous, pilose or paleaceous, stove herbs, natives of Mexico, Venezuela, and New Grenada. Flowers disposed in scorpioid racemes or spikes; calyx tube short, at length three-winged, the lobes five; petals five, obovate; stamens ten, sub-equal; anthers dissimilar. Leaves ample, petiolate, ovate or oblong. *T. scorpioides*, a perennial with the habit of *Bertolonia*, is the only species

Triolena—*continued.*

introduced. It requires a compost of rich, sandy loam and leaf mould, and a moist heat. Propagated by seeds; or by cuttings, inserted in sandy loam, under a bell glass, in bottom heat.

T. scorpioides (scorpioid-flowered). *fl.* disposed in scorpioid racemes at the tips of axillary peduncles; petals oblong-obovate. *l.* somewhat acuminate, lightly serrulated. Stem 1in. or rather more in length, somewhat woody. *h.* 6in. Chiapas, 1859.

TRIONUM. Included under **Hibiscus** (which *see*).

TRIOPTERYS (from *treis*, three, and *pteron*, a wing; the samaras are three-winged). ORD. *Malpighiaceæ.* A small genus (three species) of stove, climbing shrubs, inhabiting the West Indies and Mexico. Flowers blue or violet; calyx five-parted, with eight glands; petals clawed; stamens ten, all perfect, the alternate ones longer; racemes or panicles axillary and terminal; peduncles bracteate and bibracteolate at base. Leaves opposite, highly glabrous, lucid, veined, petiolate, without glands or stipules. It is doubtful whether the plants here described are still in cultivation, as they are very shy flowerers in this country. A compost of peat and sand is best suited to their requirements. Propagation may be effected by ripened cuttings, inserted in sand, under a hand glass, in heat.

T. rigida (rigid). *fl.* blue; racemes distant, forming a loose panicle. May. *l.* *rigid, coriaceous, orbicular-obovate, elliptic,* or oblong-linear, shining, with many parallel and anastomosing veins. West Indies, 1822.

T. r. jamaicensis (Jamaica). *l.* ½in. to 1in. long, ¾in. to ½in. broad.

T. r. lucida (clear). *l.* retuse or blunt, 1½in. long, eight to sixteen lines broad.

TRIOSTEUM (from *treis*, three, and *osteon*, a bone; alluding to the three bony seeds, or rather nutlets). Feverwort; Horse Gentian. ORD. *Caprifoliaceæ.* A genus comprising three species of hardy, perennial herbs; one is Himalayan and the others are North American. Flowers dirty white, yellow, or purple, often axillary, solitary or clustered, rarely spicate; calyx tube ovoid, the limb of five persistent lobes; corolla tubular-campanulate, the tube gibbous at base; limb oblique, with unequal, imbricated lobes; stamens five. Drupe two to (rarely) five or six-stoned. Leaves opposite, slightly connate at base, sessile, somewhat panduriform or obovate, entire. *T. perfoliatum*, the best-known species, thrives in a light, sandy soil with a little leaf mould. It may be multiplied by divisions of the plant, in spring; or by cuttings of the young shoots, inserted under a handlight, in the beginning of summer.

T. perfoliatum (perfoliate-leaved). *fl.* brownish-purple, mostly clustered, sessile. June. *fr.* orange-colour, ½in. long. *l.* oval, abruptly narrowed below, downy beneath. *h.* 2ft. to 4ft. North America, 1730. Plant softly hairy. (S. B. F. G. ser. ii. 45.)

TRIPARTED, TRIPARTITE. Parted to the base in three divisions.

TRIPETALEIA. A synonym of **Elliottia** (which *see*).

TRIPETELUS. A synonym of **Sambucus** (which *see*).

TRIPHÆNA. *See* **Tryphæna.**

TRIPHASIA (from *triphasios*, triple; alluding to the number of sepals and petals). ORD. *Rutaceæ.* A monotypic genus. The species is a greenhouse, evergreen, spiny shrub. Its fruits, when ripe, have an agreeable, sweet taste; they are sometimes preserved whole in syrup, and are occasionally sent to this country from Manilla as Lime berries. The plant succeeds in a compost of turfy loam and peat, and requires careful watering in winter. Propagation may be effected by cuttings, inserted in sand, under a glass, in heat.

T. trifoliata (three-leaved). Lime-berry Tree of Manilla. *fl.* white, sweet-scented, solitary, axillary; calyx three-lobed; petals three, free, imbricated; stamens six, free, sub-equal.

Triphasia—*continued.*

FIG. 105. FRUITING BRANCH OF TRIPHASIA TRIFOLIATA.

May to July. *fr.* red-bay colour, ovoid, as large as a hazel nut, by abortion one or two-celled, one or two-seeded. *l.* alternate, trifoliolate; leaflets ovate, obtuse, often crenate, the lateral ones smaller. *h.* 5ft. China (and broadly cultivated), 1798. See Fig. 105.

TRIPHORA. Included under **Pogonia** (which *see*).

TRIPHYSARIA (from *treis*, three, and *physa*, a bladder; alluding to the three saccate segments of the lower lip of the corolla). SYN. *Oncorrhynchus*. ORD. *Scrophularineæ*. A genus comprising about twenty-three species of hardy, annual, North American herbs, now regarded, by Bentham and Hooker, as synonymous with *Orthocarpus*. Flowers yellow or purplish, solitary in the axils of the bracts, disposed in terminal spikes; corolla with a conspicuously trisaccate lip very much larger than the slender, straight galea. Leaves alternate or nearly opposite. *T. versicolor*, the only species introduced, requires ordinary treatment.

T. versicolor (various-coloured). *fl.* cream-coloured, changing to rose-purple; lip of the corolla not more than a quarter the length of the densely pubescent tube. June. *l.* incised at apex; segments few, linear-setaceous. *h.* 9in. or more. 1837. Plant fastigiately much-branched. The proper name of this annual is *Orthocarpus erianthus roseus*.

TRIPINNATE. When the leaflets of a bipinnate leaf are themselves pinnate.

TRIPLADENIA. A synonym of **Kreysigia** (which *see*).

TRIPLARIS (from *triplex*, triple; the parts of the fructification are disposed in threes). SYN. *Velasquezia*. ORD. *Polygonaceæ*. A genus comprising not more than ten distinct species of stove trees, broadly dispersed over tropical South America. Flowers diœcious, sessile or nearly so within the bracts, disposed in long, softly or silky-pilose, simple or often branched spikes; perianth six-cleft, the male funnel-shaped, the female narrow. Nut prominently and rather acutely trigonal. Leaves alternate, shortly petiolate, often ample, ovate, oblong, or lanceolate. *T. americana* has been introduced, but it is a doubtful species, and is probably lost to cultivation.

TRIPLE-NERVED, TRIPLE-RIBBED. When of three ribs the two lateral ones emerge from the middle one a little above its base.

TRIPLET LILY. *See* **Triteleia.**

TRIPLEURA. A synonym of **Zeuxine** (which *see*).

TRIPLO. Thrice.

TRIPOLIUM. Included under *Aster*.

TRIPOLY. *See* **Aster Tripolium.**

TRIPSACUM (from *tribo*, *tripeo*, to thresh; alluding to the purpose to which the grain may be applied). ORD. *Gramineæ*. A genus consisting of two species of rather tall, greenhouse or hardy Grasses, inhabiting America, from Mexico to Texas. Spikelets unisexual, monœcious, often two or three, rarely four, many or only one at the tips of the spike, the upper part of which is male, the lower female; glumes four; peduncles solitary or twin in the upper axils. Leaves long, subulate-acuminate. The species are valuable fodder-plants in their native places, but are too tender for our climate.

TRIPTEROSPERMUM. A synonym of **Crawfurdia** (which *see*).

TRIPTERYGIUM (from *treis*, three, and *pterygion*, a small wing; referring to the fruit). ORD. *Celastrineæ*. A monotypic genus. The species is a highly glabrous, hardy, sub-scandent shrub. For culture, *see* **Celastrus.**

T. Wilfordii (Wilford's). *fl.* white, small; calyx five-lobed; petals five, inserted at the base of the disk; stamens five, on the margin of the disk, the filaments subulate; disk broadly cup-shaped; racemes short, axillary and terminal. June. *fr.* ½in. long, dry, indehiscent, three-winged, one-seeded. *l.* alternate, petiolate, ovate-oblong, attenuated at apex, serrated, thickly veined, exstipulate. *h.* 2ft. to 3ft. Japan, Formosa, and Corea, 1867. (R. G. 612.)

TRIPTILION (from *treis*, three, and *ptilon*, a wing; alluding to the three divisions of the pappus). ORD. *Compositæ*. A genus embracing about half-a-dozen species of hardy or half-hardy, annual or perennial, Chilian herbs. Flower-heads blue or white, rather small, homogamous, forming a leafy panicle or corymb at the tips of the branches; florets bilabiate, the outer lip entire or three-toothed, the inner entire or bifid; involucral bracts few, very acute and spinescent, the outer ones shorter; receptacle naked or bristly-fimbrilliferous; achenes minutely papillose. Leaves alternate, scattered, ciliated- or spiny-toothed or pinnatifid. Two species have been introduced. Seeds should be sown, on a slight hotbed, in the beginning of April. The seedlings may be pricked out, and either planted out in a sheltered place, at the end of May, or flowered in pots, in a cool, airy greenhouse. A rich, light soil is necessary. *T. spinosum* may also be increased by divisions.

T. cordifolium (cordate-leaved). *fl.-heads* white, sub-ternately clustered at the tips of the branches and branchlets; pappus bristles three, ciliated at apex. July. *l.* sessile, cordate-amplexicaul, nearly round, the margins toothed and furnished with distant spines. Stem erect, branched at apex. *h.* 6in. 1824. Annual. (B. R. 853.)

T. spinosum (spiny). *fl.-heads*, outer lips of the florets blue, inner white; involucre glabrous. July. *l.* pinnately lobed; lobes terminated by a spiny mucrone. Stem corymbose at apex. *h.* 6in. 1827. Perennial. (B. 224; B. R. xxvii. 22; P. M. B. x. 269.)

TRIQUETROUS. Three-edged; three-cornered.

TRISECTED. Cut into three parts.

TRISETUM (from *treis*, three, and *seta*, a bristle; alluding to the three awns of the flower). Including *Rostraria* and *Trichæte*. ORD. *Gramineæ*. A genus embracing nearly fifty species of hardy, perennial or rarely annual, tufted Grasses, broadly distributed over temperate and mountainous regions. Spikelets two (rarely three to six) flowered, often shining; glumes membranous, sub-scarious, or the flowering ones hyaline, the two lower ones empty; panicles sometimes densely spike-formed,

Trisetum—*continued.*

ovate or oblong, sometimes lax and effuse. Leaves flat. *T. flavescens,* the British representative of the genus, is particularly useful for agricultural purposes, and forms a portion of all productive meadows. None of the species possess any horticultural interest.

TRISMERIA. Included under *Gymnogramme.*

TRISTAGMA (from *treis,* three, and *stagma,* a drop; in reference to the three honey-glands). SYNS. *Stemmatium, Stephania* (of Willdenow), *Stephanolirion.* ORD. *Liliaceæ.* A genus comprising only three species of greenhouse, bulbous plants, natives of Chili. Flowers not numerous, in terminal umbels, pedicellate; perianth salver-shaped, with a cylindrical tube, and six sub-equal, spreading lobes; corona of three to six sub-connate or free scales, or wholly deficient; stamens six; involucral bracts two; scape simple, leafless. Leaves radical, few, narrow-linear. Corm sub-globose, tunicated. *T. narcissoide,* the only species introduced, is a pretty and interesting plant, somewhat resembling a Narcissus. It thrives in a compost of rich, sandy loam, and does not require much water. Propagation may be effected by seeds, or by offsets.

T. narcissoide (Narcissus-like). *fl.,* perianth tube dirty white, scarcely ½in. long, with six green bands; segments pure white on the face, with a slender, two-nerved, greenish keel; corona bright orange, erect; umbel five or six-flowered; scape slender, terete, purple, above 1ft. long. September. *l.* about four, erect, 6in. high, narrow-linear, glabrous, acuminate. Bulb globose, less than 1in. thick, with several brown, membranous tunics. 1875. SYNS. *Stemmatium narcissoides, Stephanolirion narcissoides.*

TRISTANIA (named in honour of Jules M. C. Tristan, 1776-1861, a French botanist). ORD. *Myrtaceæ.* This genus embraces about a dozen species of stove or greenhouse trees or tall shrubs: four inhabit the Indian Archipelago, two are natives of New Caledonia, and the rest are Australian. Flowers yellow or white, often rather small, disposed in axillary, pedunculate cymes; calyx five-parted; petals five, spreading; stamens indefinite. Leaves alternate, or approximate at the tips of the branches, somewhat whorled, rarely opposite. The following species are known to cultivation. They are very pretty, greenhouse, Australian plants, thriving in a compost of loam, peat, and sand. Half-ripened cuttings will root freely in sand, under a glass.

T. conferta (clustered). Australian Turpentine-tree. *fl.* yellow, in cymes of three to seven, usually on the young wood below the cluster of leaves; peduncle ¼in. to ½in. long, or rarely elongated. July to September. *l.* alternate, crowded at the ends of the branches so as to appear whorled, ovate-lanceolate, acuminate or rarely almost obtuse, 3in. to 6in. long. 1805. A tall tree. (R. G. 1188.) SYN. *T. macrophylla* (B. R. 1839).

T. depressa (flattened). A synonym of *T. suaveolens.*

T. macrophylla (large-leaved). A synonym of *T. conferta.*

T. neriifolia (Oleander-leaved). Water Gum-tree. *fl.* yellow, in opposite, axillary cymes, but forming usually a terminal corymb, the central shoots not growing out till after flowering. June to September. *l.* opposite, lanceolate, acute, narrowed into a short petiole, 1½in. to 3in. long, nerveless except the prominent midrib. 1804. A tall, slender shrub, or small tree, (L. B. C. 157.) SYNS. *Melaleuca neriifolia* (B. M. 1058), *M. salicifolia* (A. B. R. 485).

T. suaveolens (sweet-scented). *fl.* yellow, usually small, in axillary cymes; common peduncles ¼in. to ½in. long, more or less flattened. August. *l.* alternate, petiolate, ovate-elliptic, ovate-lanceolate, or elliptic-oblong, obtuse or acuminate, more or less distinctly penniveined and reticulated, 1½in. to 6in. long. 1820. Shrub or tree. SYN. *T. depressa.*

TRISTICHOUS. In three rows or ranks.

TRITELEIA (from *treis,* three, and *teleios,* complete; alluding to the perfect ternary arrangements of the parts of the flower). Triplet Lily. ORD. *Liliaceæ.* A genus consisting of about nine species of half-hardy, American, bulbous plants, now included, by Bentham and Hooker, under *Brodiæa.* Stamens affixed in the tube or throat, biseriate; filaments filiform, all bearing anthers. The species best-known to gardeners are here described;

Triteleia—*continued.*

they are often confused with *Milla.* All thrive in a rich, well-drained soil, in sunny positions. Propagated by offsets, and by seeds. *T. uniflora* is now and then planted amongst short grass; but, although very pretty for a season or two, it does not permanently hold its own under such conditions. It forms a good bulbous plant for pots, flowering profusely in early spring. The flowers open in bright, and remain nearly or quite closed in dull, weather.

T. aurea (golden). *fl.,* perianth yellow, five to six lines long, the segments green-striped, oblong-spathulate, slightly spreading; spathe valves two, connate at base; umbels two to six flowered; scapes one to three, erect, 2in. to 4in. long. April. *l.* six to eight, filiform, 3in. to 4in. long. Bulb whitish, tunicated. Monte Video, 1838. (Ref. B. 42.)

T. conspicua (conspicuous). A variety of *T. uniflora.*

T. laxa (loose).* Ithuriel's Spear. *fl.,* perianth blue, funnel-shaped, 1¼in. to 1½in. long, the segments lanceolate, acute, erecto-patent; spathe valves many; umbels eight to twenty-flowered; scapes fragile, erect, 1ft. to 1½ft. high. July. *l.* nearly flat, 1ft. to 1½ft. long, two to four lines broad. Bulb globose, ½in. to ¾in. thick. California, 1832. (B. R. 1685.)

T. Leichtlinii (Leichtlin's). *fl.* slightly fragrant; perianth 1½in. to 1¾in. long, the tube greenish, cylindrical, twice as long as the oblong, spreading segments, which are pure white on the face, but marked with a distinct, green keel down the back; umbels two or three, each one to three-flowered. January. *l.* about six to a cluster, overtopping the flowers, erect, glabrous, obtuse, 3in. to 4in. long. Chilian Andes, 1873. SYN. *Milla Leichtlinii* (B. M. 6236).

T. porrifolia (Leek-leaved).* *fl.,* perianth whitish-violet, funnel-shaped, nine to ten lines long, the segments lanceolate-spathulate, nearly thrice the length of the tube; spathe valves two, connate at base; umbels four to six-flowered; scape equalling the leaves. July. *l.* four or five, 6in. to 8in. long, one to two lines broad. Bulb ovoid, eight to twelve lines thick. Chili, 1868. SYN. *Milla porrifolia* (B. M. 5977; G. C. 1868, p. 990.)

FIG. 106. TRITELEIA UNIFLORA.

T. uniflora (one-flowered).* Spring Starflower. *fl.,* perianth pale lilac, ¾in. to 1¼in. long, the segments lanceolate-spathulate, slightly spreading; pedicels 1in. to 2in. long; spathe valves

Triteleia—*continued.*

two, ⅔in. to 1¼in. long; scapes one or (in gardens) very rarely two-flowered. April and May. *l.* six to nine, 6in. to 12in. long, ⅛in. to ¼in. broad. Bulb proliferous. Buenos Ayres, 1836. See Fig. 106. (B. R. 1921.) SYN. *Milla uniflora* (B. M. 3327).

T. u. conspicua (conspicuous). *fl.* broadly imbricated when expanded, the segments oblong-spathulate; pedicels often longer than in the type. SYN. *T. conspicua* (Ref. B. 43).

TRITERNATE. "When a common petiole divides into three secondary petioles, which are each sub-divided into three tertiary petioles, each bearing three leaflets" (Lindley).

TRITHRINAX (from *treis*, three, and *thrinax*, a fan; alluding to the division and form of the leaves). ORD. *Palmæ.* A small genus (two or three species) of stove, unarmed Palms, natives of Brazil, and one Chilian. Flowers small, hermaphrodite; spathes many, the lower ones inserted on the peduncle, oblong, obliquely cut, the upper ones obliquely truncate; spadices spreading, on thick peduncles, with flexuous branches. Fruit baccate, one-seeded. Leaves terminal, orbicular-ovate, flabellately multifid, glabrous; sheaths fibrous and spiny, erect or deflexed. For culture, *see* **Thrinax.**

T. acanthocoma (spine-covered). *fl.*, spadix branched. *l.* large, flabelliform, cut two-thirds of the way down into numerous linear, bifid segments. Caudex dwarf, clothed with the persistent, netted sheaths, armed with numerous, stout, reflexed spines. Rio Grande, 1879. (R. G. 959; G. C. n. s., ix., p. 661.)

T. aculeata (prickly). A synonym of *Acanthorhiza aculeata.*

T. brasiliensis (Brazilian). *fl.*, spadix within the upper leaves, much branched. *l.* large, 3ft. or more long, flabelliform, nearly orbicular; sheaths at the base composed of fibres, which are at first parallel and longitudinal, then obliquely interlaced, and finally plaited together at right angles like the pandanus mats in which coffee is sent from the Antilles and Bourbon; at the summit these stripes unite, forming a series of very long, stout spines, abruptly curved downwards. Caudex slender, 6ft. to 10ft. high, 2in. to 3in. thick. Brazil, 1875. (I. H. 203.)

T. mauritiæformis (Mauritia-like). A synonym of *Sabal mauritiæformis.*

TRITICUM (the old Latin name for Wheat, probably derived from *tritus*, crushed or ground). Wheat; Wheat Grass. Including *Ægilops.* ORD. *Gramineæ.* A genus comprising scarcely half a score species of hardy, annual or biennial, erect Grasses, natives of the Mediterranean region and Western Asia. Spikelets two to five-flowered, distichously spicate, sessile, slightly compressed; glumes rigid, the two lower ones empty; spikes terminal, cylindrical or elongated; rachis flexuous, alternately excavated, continuous or rarely articulated. Grain ovoid or oblong, often villous at apex. Leaves flat. The plants formerly included in British Floras under this genus—viz., *T. caninum, T. junceum,* and *T. repens* (Creeping Couch or Cooch Grass), the last-named being only too well known—are now referred to *Agropyrum*, the specific names being the same in both genera. To *T. vulgare*, may be referred nearly all the varieties of Wheat, a grain well known to every one.

T. æstivum (summer). A form of *T. vulgare.*

T. hybernum (winter). A form of *T. vulgare.*

T. vulgare (common). Wheat. *fl.* awned or muticous; spikelets usually four-flowered; valves ventricose, ovate, truncate, mucronate; spikes tetragonal, imbricated, the rachis tenacious. Grain free. *h.* 3ft. *T. æstivum* and *T. hybernum* are mere forms of this, and *T. dicoccum, T. monococcum,* and *T. Spelta* (Spelt) are very nearly allied.

TRITOMA. A synonym of **Kniphofia** (which *see*).

TRITOMANTHE. A synonym of **Kniphofia** (which *see*).

TRITOMIUM. A synonym of **Kniphofia** (which *see*).

TRITONIA (from *triton*, a weathercock; alluding to the variable direction of the stamens in different species). SYNS. *Aletris, Waitzia* (of Reichenbach). Including *Montbretia.* ORD. *Irideæ.* A genus including about two dozen species of cool greenhouse or hardy, bulbous plants, indigenous to South Africa. Flower one in a spathe, sessile;

Tritonia—*continued.*

perianth tube slender, straight, sometimes very short, sometimes elongated, rarely loosely incurved at apex; limb concave or broadly campanulate, nearly regular or slightly oblique, the lobes broad, all similar, or the three lower ones thickened or marked with a spot at the base, or sometimes slightly smaller; stamens affixed to the base of the limb; filaments filiform, free; spathes at the sides of the peduncle or on a few scattered branches, short, membranous, often three-toothed. Leaves few, narrow-linear or broader and ensiform, often falcate. Stem simple or slightly branched. The most important garden species are here described. All thrive in the cool greenhouse, except where otherwise indicated. The hardy species like a well-drained, sunny border, and luxuriate in a fairly dry, rich soil. Some of the greenhouse species do well in the open air if planted in a sheltered, sunny spot — such as the foot of a south wall; they should, however, be housed during winter. When grown in pots, Tritonias require plenty of water during the period of growth, and a light, airy place close to the glass. When the leaves turn yellow, water should be gradually withheld, and the roots kept dry, or nearly so, until growth recommences. Propagated by division, or by seeds.

FIG. 107. UPPER PORTIONS OF INFLORESCENCE AND LEAF OF TRITONIA HYALINA.

T. aurea (golden). A synonym of *Crocosmia aurea.*

T. capensis (Cape). *fl.* three to five, pale reddish or yellowish-white; perianth tube pale rose, twice as long as the segments; segments unequal, the lower ones red-spotted; spathe unequal-valved, straw-colour; scape 1ft. high, branched or simple, terete, flexuous at apex. September. *l.* linear-ensiform, nerved, attenuated, long-sheathing at base, shorter than the scape. 1811. (B. M. 618, 1531.) SYN. *Montbretia capensis.*

T. crispa (curled). *fl.* four to eleven, secund; perianth yellowish-white, funnel-shaped, the tube thrice as long as the segments; segments irregular, the upper ones slightly gaping, oblong-ovate, obtuse, unguiculate, flat, the lower ones narrower, obtuse, ligulate, slightly ventricose, connivent, purple-spotted in the middle; scape 6in. to 10in. long, terete, six-leaved, flexuous. April. *l.* broadly lanceolate-ensiform, undulate-crisped, margined with minute bristles. 1787. (B. M. 678.) SYN. *Gladiolus crispus* (A. B. R. 142).

T. crocata (saffron-coloured).* *fl.* seven to nine, distichous; perianth saffron-coloured, campanulate, 1in. long, the tube equalling the spathe, sub-erect, the segments sub-equal, obovate, hyaline-fenestrate at base; scape terete, flexuous, leafy at base, nearly 2ft. long. June. *l.* broadly linear-ensiform, curved, striated, acute, shorter than the scape. 1758. SYN. *Ixia crocata* (B. M. 184).

T. crocosmiflora (Crocosmia-flowered).* *fl.*, perianth about 1½in. long, funnel-shaped, with a slender, curved tube, and a spreading, six-parted, orange-scarlet limb; panicle many-flowered, erect, bent in a zigzag fashion. A handsome, hardy hybrid, raised between *T. Pottsii* and *Crocosmia aurea.* (F. M. n. s. 472; R. H. 1882, p. 124.)

T. deusta (copper-coloured). *fl.* five to ten, spicate, secund; perianth cinnabar-red, 1in. long, campanulate-infundibular, the tube short, erect; segments broadly ovate, the three inner ones carinate and spotted beneath with dark purple; spathe scarious; scape terete, flexuous, 6in. to 12in. long. May. *l.* broadly lanceolate-ensiform, acute, shorter than the scape, sheathing at base. (B. M. 622.) SYN. *Ixia crocata nigro-maculata* (A. B. R. 134).

Tritonia—*continued.*

T. fenestrata (window-like). A synonym of *T. hyalina.*

T. flava (yellow). *fl.* three or four, secund, irregularly funnel-shaped; perianth yellow, 1in. long, the tube cylindric, erect, enlarged; segments ovate, acute, the lower ones narrower; scape 6in. to 9in. long, terete, leafy at base. February. *l.* lanceolate-ensiform, acute, curved, sheathing at base, shorter than the scape, two lines broad. 1780. (B. R. 747.) SYN. *Montbretia flava.*

T. hyalina (hyaline). *fl.* seven to nine, spicate, distichous; perianth rose-colour, 1in. long, the tube short and erect; segments regularly spreading, rounded and unguiculate at apex; scape terete, 1ft. long, curved above, leafy at base. May. *l.* broadly lanceolate-ensiform, acute, thickly striated. 1801. See Fig. 107. SYN. *T. fenestrata* (B. M. 704).

T. lineata (lined). *fl.* two to seven, spicate; perianth straw-colour, veined, with orange spots, 1in. long, the tube short and sub-erect; segments sub-equal, elliptic, the lateral ones retuse, the inner ones marked with three parallel, yellow lines; scape 8in. to 18in. long, terete, erect, curved at apex, leafy at base. May. *l.* lanceolate-ensiform, acute, white-ribbed and margined. 1774. SYNS. *Gladiolus lineatus* (B. M. 487), *Montbretia lineata.*

T. miniata (scarlet).* *fl.* two to fourteen, secund or distichous; perianth scarlet, spreading-infundibular, ¾in. to 1in. long, with a short, erect, enlarged tube, and nearly regular, ovate segments; scape terete, 9in. to 12in. long, erect, curved at apex, six to eight-leaved at base. August. *l.* broadly lanceolate-ensiform, long-acuminate, yellow-striated. 1795. (B. M. 609.)

T. Pottsii (Potts').* *fl.*, perianth bright yellow, flushed on the outside with brick-red, about 1in. long, funnel-shaped, the sub-equal, oblong-obtuse segments about half as long as the tube, which is cylindrical at the base, dilated suddenly at the middle;

FIG. 108. TRITONIA POTTSII, showing Habit and detached Flower.

spikes 6in. to 9in. long, equilateral, 2in. broad when expanded, twelve to twenty-flowered. August. *l.* about four in a distichous rosette at the base of the stem, linear-ensiform, 1½ft. to 2ft. long, ½in. to ¾in. broad. Stem 3ft. to 4ft. long. Bulb globose. 1877. A very valuable and ornamental, hardy plant. See Fig. 108. (B. M. 6722.) SYN. *Montbretia Pottsii* (Gn. 1880, p. 84).

T. scillaris (Squill-like). *fl.* scentless; perianth reddish, varying to white; perianth segments regularly and equidistantly disposed; tube capillary, twice or thrice as long as the spathe. May. *l.* narrow, Grass-like. SYNS. *Ixia polystachya* (B. M. 629), *I. p. incarnata* (A. B. R. 128), *I. reflexa* (A. B. R. 14).

T. securigera (hatchet-bearing). *fl.* spicate, secund; perianth brown, 1in. long, with an erect, enlarged tube, and equal, ovate, obtuse segments; scape terete, nearly 1ft. long, curved at apex, leafy at base. May. *l.* lanceolate-ensiform, flat, acute, striated, shorter than the scape, sheathing at base. 1774. SYN. *Gladiolus securiger* (B. M. 383).

T. squalida (squalid). *fl.* distichous, infundibular-campanulate; perianth whitish-rose, 1in. long, with a short, erect tube, and equal, rounded-ovate, unguiculate segments; scape erect, simple, 2ft. high, leafy at base. May. *l.* lanceolate-ensiform, thick, yellow-ribbed and margined, acute. 1774. (B. M. 581.)

Tritonia—*continued*

T. undulata (wavy). *fl.* three or four, scentless; perianth red (said to vary through white and blue), the segments obovate, blunt, spreading; spathe membranous. June. *l.* six, linear, elegantly waved, half the length of the scape. Bulb somewhat oblong, attenuated upwards. *h.* 1ft. 1787. SYN. *Ixia crispa* (B. M. 599).

T. viridis (green). *fl.* four to seven; perianth green, the tube twice as long as the segments, somewhat arcuate-reflexed, the segments linear-oblong, sub-equal, obliquely nodding, rotate-reflexed; scape triquetrous, nearly 1ft. long, dichotomous, flexuous at apex. July. *l.* flabelloid-distichous, wavy-crisped on the margins, acute, shorter than the scape. 1788. (B. M. 1275.)

T. Wilsoni (Wilson's). *fl.*, perianth white, flushed with purple, the obovate, cuspidate segments twice as long as the tube; spikes simple or forked, lax, four to seven-flowered; scape 2ft. long below the spikes. *l.* five or six, narrow-linear, 1ft. to 1½ft. long, nearly quadrangular in section. 1886. Greenhouse.

TRIUMFETTA (named after Giov. Batt. Trionfetti, 1658-1708, an Italian botanist and author). Jamaican Paroquet-Bur. ORD. *Tiliaceæ.* A genus comprising about forty species of widely-dispersed, stove or greenhouse, stellate-pubescent herbs, sub-shrubs, or shrubs. Flowers yellow, axillary or leaf-opposed; sepals and petals five; stamens numerous. Leaves entire, or three to five-lobed, serrated. Several of the species have been introduced; but none of them are worth cultivating for ornament.

TRIURIDEÆ. A natural order of very slender, white or discoloured herbs, inhabiting tropical forests of Asia and America. Flowers minute, racemose or spicate, monœcious or diœcious, rarely unisexual; pedicels bracteate; perianth three, four, six, or eight-parted, hyaline; segments connate at base, valvate, the tips often caudate; stamens few, various in number, sessile in the base of the perianth; anthers four-celled, two-valved. Carpels many; ripe ones obovoid, coriaceous and indehiscent, or two-valved, one-seeded. Leaves wanting, or bract-like, alternate, and nerveless. Stem simple, rarely divided, filiform, straight or flexuous, erect. The order comprises only a couple of genera — *Sciaphila* and *Triuris* — and about sixteen species.

TRIXAGO (of Mœnch). A synonym of **Stachys** (which *see*).

TRIXIS (from *trixos*, triple; alluding to the three-celled, triangular capsule). SYNS. *Castra, Perdicium* (in part). ORD. *Compositæ.* A genus embracing about thirty species of stove or greenhouse herbs or shrubs, of variable habit, natives of Central and South America and the West Indies. Flower-heads yellow or whitish; florets bilabiate, the outer lip three-toothed, the inner bipartite or bifid; involucral bracts often two-seriate; receptacle small; pappus bristles copious. Leaves alternate, sometimes decurrent. The two members of the genus which have been introduced are described below. Both thrive in a compost of sandy loam and leaf mould. *T. divaricata auriculata* requires the protection of a warm greenhouse in winter; it may be increased by cuttings, inserted in sand, under a bell glass, in May. Seeds of *T. senecioides* should be sown in the open ground, in April.

T. auriculata (eared). A synonym of *T. divaricata auriculata.*

T. divaricata auriculata (divaricate, eared). *fl.-heads* white or yellowish-white; involucral scales acuminate. August and September. *l.* sessile, oval-lanceolate, acuminate, denticulate, nearly glabrous, dilated at base into obtuse auricles. Stems climbing, suffruticose. *h.* 1½ft. Brazil, 1827. (B. M. 2765, under name of *T. auriculata.*)

T. senecioides (Senecio-like). *fl.-heads* white, solitary, on long peduncles; involucral scales in two or three series. August and September. *l.* all sessile and amplexicaul, oblong, sinuate-lobed,

Trixis—*continued.*

toothed, pilose-glandular above, slightly woolly beneath. Stems branched from the base, panicled, pubescent and pilose-glandular. *h.* 1ft. Chili, 1821. Annual. (H. E. F. 101.)

TRIXIS (of Gærtner). A synonym of **Proserpinaca** (which *see*).

TRIZEUXIS (from *treis*, three, and *zeuxis*, a union; alluding to the cohesion of the three sepals). ORD. *Orchideæ.* A monotypic genus. The species is a small, stove, epiphytal Orchid, of no great beauty, but remarkable in having the lip superior, *i.e.*, with the parts of the flower in their proper position, the ovary not being twisted as in the generality of Orchids. The plant will succeed if fastened to a piece of wood. It may be multiplied by divisions.

T. falcata (sickle-leaved). *fl.* green, minute, densely racemose along the branches of the slender scape, which is 6in. to 12in. high. *l.* distichous-rosulate, oblong-linear, acuminate, slightly falcate, 3in. to 6in. long, ½in. broad. Columbian Andes and Trinidad, 1820. (H. E. F. 126; L. B. C. 975; L. C. B. 2.)

TROCHETIA (named in honour of R. I. G. du Trochet, 1771-1847, a French physiologist and writer on botany). ORD. *Sterculiaceæ.* A genus comprising about half-a-dozen species of stove or greenhouse, evergreen shrubs or trees, natives of Mauritius, St. Helena, and Madagascar. Flowers rather large, often pendulous; calyx five-parted, coriaceous; petals five, flat, broad, persistent; staminal column short, bearing five ligulate staminodes; bracteoles none, or minute and deciduous; peduncles axillary, one to three-flowered. Leaves entire, coriaceous. Two species have been introduced. They thrive in a compost of well-drained loam, leaf mould, and sand. Cuttings will root in sand, under a glass.

T. erythroxylon (red-wooded). The correct name of plant described in this work as *Melhania erythroxylon.*

T. grandiflora (large-flowered). A synonym of *T. triflora.*

T. triflora (three-flowered). *fl.* white and yellow; sepals acuminate, 1in. long; petals obovate, 1½in. long; staminal column cylindrical; peduncles much deflexed, exceeding the petioles, three-flowered. December. *l.* oblong, crowded near the ends of the branches, 4in. to 6in. long, acute, sub-entire or dentate, broadly rounded at base, coriaceous, brown-tomentose beneath; petioles erect, 1in. to 2in. long. *h.* 10ft. Mauritius, 1842. Stove. (B. R. 1844, 21, under name of *T. grandiflora.*)

TROCHISCANTHES (from *trochiskos*, a small wheel, and *anthos*, a flower; in allusion to the form of the umbels). ORD. *Umbelliferæ.* A monotypic genus. The species is a tall, hardy, perennial herb, with small, white, polygamous, umbellate flowers, and ample or ternately compound radical or lower leaves. It is a native of the South of France and the Alps, and has no horticultural value.

TROCHLEATE. Twisted like a pulley.

TROCHOCARPA (from *trochos*, a wheel, and *karpos*, fruit; alluding to the radiated arrangement of the cells of the fruit). SYN. *Decaspora.* ORD. *Epacrideæ.* A genus including half-a-dozen species of greenhouse, erect or diffuse shrubs or small trees, limited to Australia. Flowers spicate, each sessile within the small, subtending bract and two bracteoles; calyx five-parted; corolla tube cylindrical or campanulate, glabrous or with reflexed hairs inside at the top; lobes recurved, usually shorter than the tube; filaments short, filiform. Fruit a globular or depressed drupe, containing ten stones (or fewer by abortion). Leaves usually petiolate, flat or convex. *T. laurina*, the only species yet introduced, is a handsome tree, thriving in sand and fibry peat. Cuttings of the points of young shoots, or stubby, short side shoots getting firm at the base, should be inserted in sand, under a bell glass, and kept close in a frame or pit, at any time during spring or summer. More heat and moisture must be allowed after the flowering period, and an abundance of air and light before the end of the autumn.

Trochocarpa—*continued.*

T. laurina (Laurel-like). *fl.* white, small, in terminal, solitary or clustered, interrupted spikes, ¾in. to 1in. long. June. *l.* usually clustered at the end of each year's shoots, so as to appear almost whorled, petiolate, broadly oval or elliptic, acuminate, shining, five to seven-nerved on both sides, mostly 1½in. to 2in. long. *h.* 20ft. to 40ft. 1829. (B. M. 3324.)

TROCHOSTIGMA. A synonym of **Actinidia** (which *see*).

TROLL FLOWER. An old name for the genus *Trollius.*

TROLLIUS (said to be derived from an old German word *trol*, a globe). Globe Flower; Globe Ranunculus. ORD. *Ranunculaceæ.* A genus comprising about nine species of hardy, perennial, erect herbs, inhabiting the temperate and frigid regions of the Northern hemisphere. Flowers yellow or lilac, ample, solitary or few; sepals five or indefinite, regular, petaloid, commonly deciduous; petals five to eight, small, clawed, rarely indefinite, long-linear. Leaves alternate, palmately lobed or dissected. The best-known species are here described. A rather heavy soil and moist situation are most generally suitable, but Globe Flowers succeed well in the front part of mixed borders, and in many other positions where the soil is fairly good. The plants are of very compact and floriferous habit. Propagation may be effected by divisions, which should preferably be made in September; or by seeds. The latter do not usually vegetate until the year after they are sown.

FIG. 109. FLOWERING STEM AND ROOT-LEAF OF TROLLIUS EUROPÆUS.

T. acaulis (stemless). *fl.* golden-yellow, 2in. in diameter; sepals seven, broadly oval, obtuse; petals fourteen, narrow-cuneate, ¼in. long, with a very short claw. July. *l.* five-partite, argutely cut. Stem dwarf, leafy above. Western Himalayas, 1841. (B. R. xxix. 32.)

Trollius—*continued.*

T. altaicus (Altaian). *fl.* pale orange or yellow, 2in. in diameter; sepals ten, often fifteen to twenty, broad, obtuse, rarely acute, occasionally crenulate; petals five to fifteen, narrow-linear, obtuse. *l.* much divided, similar to those of *T. europæus*. *h.* 1ft. to 1½ft. 1857. (R. G. 188.)

T. americanus (American). A synonym of *T. laxus*.

T. asiaticus (Asiatic). *fl.* dark yellow; sepals ten, spreading; petals ten, longer than the stamens. May and June. *h.* 1ft. to 1½ft. Siberia, 1817. This species closely resembles *T. europæus*, but the stems are usually one-flowered. (B. M. 235; R. G. 403.)

T. caucasicus (Caucasian). *fl.* yellow; petals shorter than the stamens. Otherwise this species closely resembles *T. asiaticus*. Caucasus, 1817.

T. europæus (European).* Boits; Common Globe Flower; Golden Ball, &c. *fl.* pale yellow, globose, 1in. to 1½in. in diameter; sepals orbicular, concave; petals oblong, equalling the short stamens. June to August. *l.*, radical ones petiolate, sub-orbicular, five-partite, the segments cuneate, lobed and cleft; cauline ones smaller, sessile. Stem 6in. to 2ft. high, simple, leafy. Arctic Europe (Britain), &c. See Fig. 109. (Sy. En. B. 42.)

T. laxus (loose). *fl.* pale greenish-yellow or nearly white, twice the size of the common Buttercup; sepals five or six, spreading; petals fifteen to twenty-five, inconspicuous, much shorter than the stamens. May. *l.* palmately cut. *h.* 6in. to 9in. North America, 1805. SYN. *T. americanus* (B. M. 1988; L. B. C. 56).

T. patulus (spreading). *fl.* golden-yellow; sepals five, spreading; petals one to five, equalling the stamens. *h.* 3in. to 12in. Siberia, 1800.

TROMOTRICHE. Included under **Stapelia** (which *see*).

TROPÆOLEÆ. Included under *Geraniaceæ*.

TROPÆOLUM (from *tropaion*, a trophy; the leaves are of the form of a buckler, and the flowers resemble an empty helmet). Golden Nasturtium; Indian Cress; Yellow Larkspur. ORD. *Geraniaceæ*. A genus comprising about thirty-five species of very handsome, twining or rarely diffuse, greenhouse or hardy, South American, annual or perennial herbs. Flowers orange, yellow, or rarely purple or blue, irregular; sepals five, loosely imbricated or sub-valvate, connate at base, the dorsal one produced into a free spur; petals five, or fewer by abortion, loosely perigynous, imbricated, the two upper ones more or less dissimilar to the rest; stamens eight, free, unequal; peduncles axillary, one-flowered. Fruit consisting of indehiscent, hardened-fleshy, wrinkled, one-seeded carpels. Leaves alternate, peltate or palmately angled, lobed or dissected; stipules wanting, or rarely minute. Tropæolums are mostly familiar twining plants, well adapted for growing in pots or planting out in greenhouses, and training up rafters, &c. They also succeed well outside during summer, but the foliage will not withstand the least frost without injury. For covering arbours, &c., or anything which is unsightly, the tall-growing annuals are not easily surpassed; *T. Lobbianum*, *T. majus*, and *T. peregrinum* are the best for the purpose. The dwarf varieties of *Tropæolum* are beautiful objects for mixed flower borders, and for placing in beds by themselves; they are exceedingly compact and floriferous. The annual species are readily raised from seeds, sown in the open border, in any moderately rich soil, in spring; or, as is best with *T. peregrinum*, they may be sown in pots, under glass, hardened off, and planted out at the end of May or beginning of June. The double varieties are practically perennials, as they must be increased by cuttings, which root readily in bottom heat; during winter, the plants must be kept in a light, airy situation. The tuberous-rooted section, such as *T. azureum* and *T. tricolorum*, thrive in sandy peat and leaf mould, or in turfy loam and peat, and do best under cool-house treatment. They are best grown singly in pots, and each plant trained over a little trellis; when in flower, they are exceedingly pretty and interesting. When growing, they require plenty of light, and abundance of water; when the stems die down, the pots should be stored away in some dry, cool spot, and water withheld until growth recommences, when the tubers must

Tropæolum—*continued.*

be carefully shaken out and repotted; this section may be increased from seeds, or by means of cuttings of the slender, wiry shoots, which callus and form small tubers in one season. *T. speciosum* requires a constantly moist and shaded position in a peat border, and is impatient of disturbance at the roots; it is propagated either from seeds, or by division of the long-creeping, underground rhizomes. *T. polyphyllum* likes a warm, sunny spot, rather dry than otherwise. Tropæolums do not require a very rich soil; they flower more profusely if not encouraged to grow over-luxuriantly.

Except where otherwise stated, the under-mentioned species are perennial twiners.

T. aduncum (hooked). A synonym of *T. peregrinum*.

T. albiflorum (white-flowered). *fl.*, petals whitish, within lined and dotted with gold and purple, large, plicate, undulated, the lower ones very long- and narrowly-unguiculate. Summer. *l.* small, glaucous, digitate; segments three to five. Stems very slender, elongated. Peru or Chili. Greenhouse. (F. d. S. 241.)

T. azureum (azure-blue).* *fl.* scarcely odorous; petals azure-blue, equal, obovate, attenuated into a long, greenish-white claw, deeply emarginate at apex. October. *l.* peltate, deeply five-lobed; lobes obovate or obversely lanceolate, the middle one larger and mucronate. Chili, 1842. Greenhouse. (B. R. xxviii. 65; F. d. S. May, 1846; P. M. B. ix. 247.) *grandiflorum* is a large-flowered form. (F. d. S. 1160; I. H. iii. 85.)

T. azureum (azure-blue), of Hooker. A synonym of *T. violæfolium*.

T. Benthii (Benth's). *fl.*, calyx segments apiculate, equalling the straight spur; petals yellow; peduncles filiform, twice as long as the leaves. June. *l.* sub-orbicular, deeply peltately cut, pale green beneath; leaflets five or six, obovate, the front one larger, retuse-apiculate at apex. Root tuberous. Bolivia, 1850. Half-hardy.

T. brachyceras (short-horned). *fl.*, calyx segments obtuse; spur very short, obtuse; petals yellow, conformed. June. *l.* peltately cut; segments six or seven, oblong-obovate, entire, sessile. Root tuberous. Chili, 1830. Half-hardy. (B. M. 3851; B. R. 1926; F. d. S. 368; P. M. B. iv. 55; S. B. F. G. ser. ii. 370.)

T. chrysanthum (golden-flowered). *fl.*, petals golden-yellow, the two upper ones cuneate, shorter than the calyx and lined below with orange-red veins, the three lower ones longer, unguiculate, flabellately plicate. Summer. *l.* peltate, orbicular-triangular, truncate at base, angularly three-lobed at apex, the margins obsoletely repand-crenate. New Grenada, 1874. Greenhouse. (F. d. S. x. 1005; I. H. xix. 102.)

T. crenatiflorum (crenate-flowered). *fl.*, petals yellow, obovate, spreading, sub-equal, truncate and somewhat bicrenate at apex, the two upper ones lined with blood-colour. June. *l.* peltate, semi-orbicular, five-lobed; lobes obtuse or retuse, mucronulate. Peru, 1844. Greenhouse. (B. M. 4245; F. d. S. 166.)

T. Deckerianum (Decker's). *fl.*, calyx pubescent, longer than the straight, scarlet spur; petals blue, unequal, toothed, fimbriate-ciliated; filaments and anthers blue; style yellow. July. *l.* peltate, triangular, five to seven-lobed, transversely truncate at base. Venezuela, 1849. Greenhouse. (B. H. ii., p. 245; F. d. S. 490; L. & P. F. G. i. 16.)

T. digitatum (digitate-leaved). *fl.*, sepals appendiculate at base; petals golden, dentate-ciliated. July. *l.* peltate, five to seven-lobed; lobes rounded, entire. Venezuela, 1850. Hardy annual. (R. G. 1146, bearing name of *T. Gærtnerianum* on plate, but *T. digitatum* in letter-press.)

T. edule (edible). *fl.*, spur acuminate; petals orange and green, sub-conformed, obcordate, equalling the sepals. March. *l.* pseudo-compound, peltate, six-lobed; leaflets or segments oblong-lanceolate, attenuated at both ends, glabrous. Stems terete. Chili, 1841. Half-hardy. (B. 248; P. M. B. ix. 127.)

T. Gærtnerianum. *See* **T. digitatum.**

T. Jarrattii (Jarratt's).* *fl.*, calyx bright orange-scarlet, spotted with yellow at base; petals bright yellow, the two upper ones pencilled with rich brown; pedicels 2½in. to 3½in. long. June. *l.* alternate, six or seven-lobed; petioles 1in. long, slender, twining. Santiago, 1836. Greenhouse. (P. M. B. v. 29.)

T. Lobbianum (Lobb's).* *fl.*, calyx long-spurred, pilose; petals orange, obovate, the two upper ones entire, scarcely lobed, the three lower ones smaller, deeply toothed, fringed below, long-clawed. November. *l.* peltate-orbicular, obscurely lobed, glaucous beneath; lobes mucronulate; petioles (and peduncles) pilose. Columbia, 1843. Greenhouse. (B. M. 4097; F. d. S. ii. 3; P. M. B. xi. 271.)

T. L. fimbriatum (fringed). *fl.*, petals fringed. *l.* lobed. Of hybrid origin. (R. H. 1856, p. 101.)

T. majus (greatest). Great Indian Cress or Nasturtium. *fl.* rich orange, large and showy, the two upper petals marked with deep reddish-brown, all obtuse; peduncles long. June to October. *l.* alternate, entire, nearly round peltate, sometimes

Tropæolum—*continued.*

FIG. 110. PORTION OF FLOWERING STEM OF TROPÆOLUM MAJUS.

undulated or lobed. Peru, 1686. Hardy annual. The flowers and young leaves are frequently used in salads, and the former also for garnishing. If gathered when young and quite green,

FIG. 111. TROPÆOLUM MAJUS ATROPURPUREUM NANUM, showing Habit, detached Flower, and Leaf.

the fruits make an agreeable pickle. In certain conditions of atmosphere, the flowers have the power of emitting electric

FIG. 112. TROPÆOLUM MAJUS NANUM COCCINEUM FOLIIS-AUREIS.

Tropæolum—*continued.*

sparks in the evening. See Fig. 110. (B. M. 23.) There are very many varieties of this species, including *atropurpureum nanum* (see Fig. 111; F. d. S. 1286), a dwarf sort, known in gardens as TOM THUMB; *atrosanguineum* (B. M. 3375; P. M. B. i. 176; S. B. F. G. ser. ii. 204), a form with dark blood-coloured flowers; and numerous double-flowered forms of which, perhaps, GRANDIFLORUM PLENISSIMUM, double yellow, with a deep maroon blotch at the base of each petal, and HERMINE GRASHOFF (Gn. xx. 398), with scarlet flowers, are two of the best. A few of the finest dwarf kinds are: EMPRESS OF INDIA, bright crimson; GOLDEN KING, golden-yellow; KING OF TOM THUMBS, scarlet; KING THEODORE, very dark; PEARL, creamy-white; RUBY KING, rosy-scarlet. A TOM THUMB form, with golden leaves, is represented in Fig. 112.

FIG. 113. TROPÆOLUM TRICOLORUM, showing Habit and Portion of detached Flowering Stem.

T. minus (smallest). Small Indian Cress or Nasturtium. *fl.* deep yellow, streaked with orange and red; petals each ending in a bristle-like point. June to October. *l.* somewhat repand. Peru, 1596. Hardy annual. This resembles *T. majus*, but is much smaller and weaker. The fruits, being smaller, are preferred to those of *T. majus* as a substitute for capers. (B. M. 98.)

T. Moritzianum (Moritz'). *fl.*, spur dirty yellow, greenish towards the apex, straight; petals yellow, the upper ones margined and nerved with cinnabar-red, incised-ciliated. July. *l.* peltate, seven-lobed, transversely truncate at base, glabrous; lobes rounded, obsoletely mucronate. Caraccas, 1839. Greenhouse. (B. v. 221; B. M. 3844; P. M. B. viii. 199.)

T. pendulum (pendulous). *fl.* pendulous; calyx yellow, the spur straight; petals yellow, spathulate, the two upper ones marked with parallel, red lines and a dingy violet spot, the three lower ones self-coloured. July. *l.* peltate, glaucous beneath, rounded-truncate at base; lobes five, the middle one mucronate. Branches terete. Central America, 1852. Greenhouse.

T. pentaphyllum (five-leaved). Five-fingered Indian Cress. *fl.*, calyx dull purple, 1½in. long, the limb greenish, marked with deep purple within; petals bright vermilion, small, roundish, sub-unguiculate; peduncles 4in. long, solitary, axillary. June and July. *l.* about 2in. across, digitate, of five oblong, entire, petiolulate, soft, glabrous, spreading leaflets; petioles purple, 2in. long, twisted like tendrils. Stem purple, slender, greatly elongated, slightly twisted, branched. Root a large, oblong tuber. Buenos Ayres, 1829. Half-hardy. (B. M. 3190.) SYN. *Chymocarpus pentaphyllus.*

T. peregrinum (exotic).* Canary-bird Flower; Canary Creeper. *fl.*, petals yellow, scarcely longer than the calyx, the two upper ones lobed, mucronate, the three lower ones smaller, fringed; spur hooked, about the length of the upper petals. June to October. *l.* peltate-nerved, somewhat kidney-shaped, five to seven-lobed; lobes entire, mucronate. Peru and Mexico, 1810. Hardy annual or greenhouse perennial. (A. B. R. 597; B. M. 1351; B. R. 718; S. B. F. G. ser. ii. 134.) SYN. *T. aduncum.*

T. pinnatum (pinnate-flowered). *fl.* pinnate; petals yellow, wedge-shaped, toothed at the apex. June to November. *l.* somewhat peltate; lobes obtuse, unequal. Hybrid, raised in 1800. Greenhouse. (A. B. R. 535.)

T. polyphyllum (many-leaved).* Yellow Rock Indian Cress. *fl.*, calyx with an attenuated spur; petals yellow, longer than the calyx, obcordate, the upper ones obovate, sessile, the lateral lower ones emarginate, clawed. June. *l.*, leaflets ten to twelve, digitate, fleshy, oblong, entire, the middle one trifid. Chili, 1827. Plant prostrate. Hardy. (B. M. 4042; F. d. S. 2066; G. C. n. s., xx., p. 241; P. M. B. x. 175.)

Tropæolum—*continued.*

T. sessilifolium (sessile-leaved). *fl.* on solitary or twin terminal peduncles; calyx with a long spur; petals red, shaded with violet, conformed, spathulate-obovate, emarginate, exceeding the calyx. Summer. *l.* sessile, five-lobed; lobes oblong, glabrous, glaucous. Chili, 1868. Plant prostrate. Greenhouse. (G. C. 1868, p. 842.)

T. Smithii (Smith's). *fl.*, spur of the calyx straight, twice as long as the corolla; petals yellow, all lobed and fringed. June. *l.* peltate-nerved, deeply palmately five-lobed. New Grenada, 1775. Hardy annual or greenhouse perennial. (B. M. 4385; F. d. S. 384.)

T. speciosum (showy).* Flame-flowered Nasturtium. *fl.*, spur long; petals scarlet, obcordate, exceeding the calyx, the upper ones narrow-cuneate, the lower ones sub-orbicular. June. *l.* sub-peltate, six-lobed; lobes oblong, obtuse, pilose-pubescent beneath. Stems pilose-pubescent. Chili, 1846. Hardy. (B. M. 4323; F. d. S. 281; P. M. B. xiv. 173.)

T. tricolorum (three-coloured).* *fl.* solitary, much shorter than the pedicels; calyx orange-scarlet, tipped with black, turbinate; petals orange, obovate, entire, equal, shorter than the slender, attenuated spur. June to October. *l.* peltately five or six-parted; segments obovate or oblong, obtuse. Chili, 1828. Half-hardy. A very showy plant. See Fig. 113. (B. M. 3169; B. R. 1935; F. d. S. 369, 1881; P. M. B. ii. 123; S. B. F. G. 270.) There are varieties of this species with yellow and green flowers, viz., *T. t. Regelianum* and *T. t. Schultzii* (R. G. 428).

FIG. 114. PORTION OF FLOWERING STEM OF TROPÆOLUM TUBEROSUM.

T. tuberosum (tuberous-rooted). Peruvian Nasturtium. *fl.*, petals yellow and red, almost as long as the calyx, entire or toothed. September. *l.* peltate-nerved, five-lobed, transversely truncate at base, smooth. Roots tuberous, depressed, edible when boiled. Peru, 1827. Half-hardy. See Fig. 114. (B. H. ii. 36; B. M. 3714; F. d. S. 452; P. M. B. v. 49; R. H. 1853, 18.)

T. umbellatum (umbellate-flowered). *fl.* umbellate; calyx cylindrical, longer than the slightly curved, obtuse spur; petals orange-red, spathulate, straight, acute, three of them exceeding the calyx, the other two minute and scale-like. June. *l.* somewhat peltate, cordate, five-lobed. Quito, 1846. Greenhouse. (B. M. 4337; F. d. S. 302.)

T. violæfolium (Viola-leaved). *fl.*, spur short, slightly curved; petals at first of a beautiful azure-blue, becoming paler, spreading, equal, obovate, deeply emarginate at apex, attenuated into long, whitish claws. October. *l.* peltate, deeply five-lobed; segments unequal, obovate or obversely lanceolate, obtuse, the middle one larger, mucronulate. Root tuberous. Chili. Greenhouse. (B. M. 3985, under name of *T. azureum.*)

T. Wagnerianum (Wagner's). *fl.*, spur pink, straight, tubular, 1in. to 1½in. long; petals violet, wedge-shaped, seven-toothed towards the apex; pedicels very slender, about 2in. long. July. *l.* peltate, oblong-triangular, rather obliquely-hastate, truncate at base, acuminate at apex, pale beneath. Venezuela, 1850. Greenhouse. (B. H. ii. 1; F. d. S. 553.)

TROPHIANTHUS. A synonym of **Aspasia** (which see).

TROPHIS (from *trophe*, fodder; alluding to the use of some of the species). Ramoon-tree. SYN. *Bucephalon.* ORD. *Urticaceæ.* A small genus (five or six species) of stove trees or shrubs, inhabiting the West Indies, Mexico, and the Andes of South America. Flowers sessile or shortly pedicellate; spikes or racemes solitary or twin in the axils, the males loosely bundle-flowered, the females often short and few-flowered. Leaves alternate, petiolate, entire or few-toothed, those of the sterile branches sometimes lobed. The leaves of *T. americana* are said to be occasionally used in the West Indies as fodder. One or two of the species have been introduced, but they are probably lost to cultivation.

TROPICAL DOCKWEED. See **Pistia Stratiotes.**

TROPIDIA (from *tropis*, *tropidos*, a keel; in allusion to the keel-shaped labellum). SYNS. *Cnemidia, Decaisnea, Govindovia, Ptychochilus.* ORD. *Orchideæ.* A small genus (about five species) of tall, leafy, often branched, stove, terrestrial Orchids, natives of the East Indies, the Malayan Archipelago, and the Pacific Islands. Flowers mediocre, in short spikes; sepals connivent; lip sessile at the base of the column, erect. Leaves ample or reed-like. None of the species are in cultivation in this country.

TROPIS. In Greek compounds, this term signifies the keel of a papilionaceous flower or any part resembling it.

TROS. Included under *Narcissus.*

TROTTLES. See **Symphytum asperrimum.**

TROWEL. A garden Trowel is a most useful and well-nigh indispensable tool for lifting small plants from one place and inserting them in another, and for planting anything out which has previously been growing in pots, as, for example, during the bedding-out season, when numerous subjects have to be so transferred. Trowels are preferable to dibbers at any time, as with them the holes may be made larger, and the roots spread out better. Fern Trowels are narrower than the ordinary garden kind; as the name implies, they are intended for lifting Ferns, and are chiefly used by collectors of these plants when searching for them in their native habitats.

TROXIMON (from *troximos*, edible, which the plants of this genus are not). SYN. *Agoseris.* Including *Ammogeton* and *Macrorhynchus.* ORD. *Compositæ.* A genus comprising about sixteen species of hardy, almost stemless, annual or perennial herbs, natives of North-western and Southern extra-tropical America. Flower-heads yellow or orange, homogamous; florets ligulate, truncately five-toothed at apex; involucral bracts in many series, the outer ones gradually shorter and broader; receptacle flat, naked or foveolate, rarely bearing a few paleæ between the florets; achenes glabrous; pappus bristles copious; scape erect, leafless, one-headed. Leaves radical, entire, deeply toothed, or pinnatifid. *T. glaucum* and its variety are now probably the only known garden representatives of the genus, although others have been introduced. They are perennials, thriving in sandy loam. Propagation may be effected by divisions.

T. glaucum (glaucous). *fl.-heads* bright yellow, nearly 1in. in diameter; involucral bracts loosely imbricated in three or four series. May and June. *l.* linear-lanceolate, acute, entire, or rarely with one or two small teeth. *h.* 1ft. United States, 1811. (B. M. 1667.)

T. g. dasycephalum (thick-headed). *fl.-heads*, receptacle often bearing a few chaffy scales among the florets; involucre woolly, at least when young. *l.* (and scape) often somewhat pubescent. (B. M. 3462). SYN. *Ammogeton scorzoneræfolium.*

TRUE LOVE. See **Paris quadrifolia.**

TRUFFLES. Fungi, living below ground, or rarely on the surface of the soil. They are, externally, somewhat like potatoes or other tubers; hence, the genus of most importance has been named *Tuber*, and from it

Truffles—*continued.*

the order is called *Tuberacei.* The structure of the order is as follows: The exterior is covered with a layer of thickened cells, which incloses a mass of mycelium. In

FIG. 115. TUBER—Section showing dark Surface Layer and Cavities (shaded) in which the Asci and Spores lie.

this may be cavities (see Fig. 115), lined with a layer of cylindrical asci; or the asci may be packed among the cells of the mycelium, without cavities. In each ascus is a definite number of spores (usually four or eight), which are often beautifully marked and ridged, and are usually coloured. The *Tuberacei* thus belong to the division *Ascomycetes.* While young, they are fleshy in texture; but when mature, the interior is filled with a dusty-brown mass of spores, so that, in this stage, they look much like Puff-balls (*see* **Lycoperdon**), to which, however, they are not nearly related. The term Truffle is sometimes employed to denote a second group of subterranean Fungi, of very similar appearance, named the *Hypogæi*; but in the latter there are no asci, and the spores are produced, singly, on the tips of outgrowths from the ends of large cells (basidia), as in Mushrooms; but the basidia line internal cavities, instead of being exposed on the surface, as in the last-named (which *see*). It is better to restrict the name Truffles to the *Tuberacei,* or to distinguish the latter as the "true Truffles." They include a considerable number of genera, of which a good many are represented in the South of England; but they become much rarer northwards, and few reach Scotland. The number of species is comparatively small. They vary in size, from about ½in. to 3in. or 4in. in diameter. The genera are distinguished by the nature and markings of the outer coat (peridium), and by the forms of the asci and spores.

The chief importance of Truffles arises from the fact that several species are highly esteemed as condiments, on account of the flavour that they impart to the food with which they are cooked. The edible Truffles chiefly belong to the genus *Tuber, T. æstivum* being almost the only species sold in English markets. In France and other European countries, several other species are also made use of, and are even more highly esteemed. The large White Truffle (*Choiromyces albus*) is sometimes employed, but is inferior to the genus *Tuber.* Owing to their concealed growth, Truffles are very apt to be overlooked; and Truffle-hunters take advantage of the keen sense of smell of dogs, or occasionally of pigs, these animals being trained to hunt over the ground, and to stop over the spots where they scent the Fungi. The plants prefer chalky soils, and there seems to be a connection between the various species and certain trees. For example, *T. æstivum* is usually found in the shade of Beeches, though it also grows under Birches, Chestnuts, Hazels, Hornbeams, and Oaks; and *T. macrosporum* and *T. brumale* prefer the shade of Oaks. Attempts have been made to cultivate Truffles, or, rather, to promote their growth in suitable localities. The method found most successful in France is to inclose spaces over chalky soils, and to sow them with acorns. When the Oaks are about twelve years old, Truffles are usually sufficiently abundant in the plantation to be worth working; and they continue to be produced for twenty or thirty years. It has been observed on Salisbury Plain that when plantations of Beeches are formed, alone or mixed with Firs, in a few years Truffles are to be found in them, and they continue productive for from ten to fifteen years. Experiments by watering the soil with the washings from sliced Truffles have not given decisive results.

TRUMPET CREEPER. A common name for *Tecoma radicans* and other species.

TRUMPET FLOWER. A common name for various large trumpet-shaped flowers; *e.g.,* those of *Bignonia, Tecoma,* &c.

TRUMPET HONEYSUCKLE. A common name for **Lonicera sempervirens** (which *see*).

TRUMPET LEAF. *See* **Sarracenia.**

TRUMPET LILY. *See* **Richardia africana.**

TRUMPETS. A common name for **Sarracenia flava** (which *see*).

TRUNCARIA. A synonym of **Adelobotrys** (which *see*).

TRUNCATE. Terminating very bluntly and abruptly, as if a piece had been broken off.

TRYMALIUM (from *trymalia,* a perforation; in reference to the small holes at the top of the capsule). ORD. *Rhamneæ.* A small genus (five species) of Australian, greenhouse shrubs, with the habit and deciduous stipules and bracts of *Pomaderris,* but with smaller flowers and a more slender inflorescence. Calyx limb five lobed to the base; petals five, hood-shaped, entire or three-lobed, but not usually inclosing the anthers; stamens five, the filaments rather short; panicles usually narrow, or the cymes few-flowered. None of the species are particularly ornamental. *T. Billardieri* is grown in this country. It thrives in sandy loam and leaf mould, and may be increased by cuttings, inserted in a similar compost, under a bell glass.

T. Billardieri (Labillardière's). *fl.* numerous, in loose, narrow, terminal panicles 2in. to 6in. long. *l.* sometimes broadly ovate or obovate, very obtuse, 1in. to 2in. long, sometimes ovate or ovate-lanceolate, more or less acuminate, 2in. to 3in. long, entire or crenate, glabrous or pubescent above, white, hoary, or villous beneath. A tall shrub.

TRYPHÆNA (from a Greek proper name). Also written *Triphæna.* A genus of Night-moths, nearly related to **Noctua** (which *see*) and *Agrotis*; but the species are readily distinguished from those of both genera by the hind wings, which are yellow or orange, with a black band near the hind margin, from which it is separated only by a fringe similar in colour to the area of the wings. There is usually a dark, crescentic mark near the middle of each hind wing. These moths are well known to amateur entomologists as the "Yellow-Underwings." The fore wings are rather narrow, and vary in ground-colour from grey to olive-green or rich umber-brown. Their front margin is sometimes pale; and there are several narrow cross-bars (some paler and others darker than the ground-colour), and two spots near the middle of each wing outlined with grey. There are six British species, varying from 1¼in. to 2¼in. in spread of front wings. They differ, also, in the breadth

Tryphæna—*continued.*

of the black band, and in the depth of colour in the yellow or orange area of the hind wings. The larvæ mostly belong to the group of **Surface Caterpillars** (which *see*) in general appearance and in habits. The body is smooth and cylindrical, and the head small. The colour varies from dingy ochreous, or dull yellowish-green, to dark brown, with (usually) a paler line down the back, and pale and dark mottlings; but space will not permit of giving minute details.

A very common species is *T. pronuba* (Common Yellow Underwing). The front wings expand to from 2in. to $2\frac{1}{4}$in.; the hind wings are yellow, with the black marginal band rather narrow, and there is no dark spot in their middle. The larvæ of this species feed near the top of the roots of Lettuces, Cabbages, and almost all other kinds of garden vegetables, as well as on many flowering plants. They burrow into the plants, or hide just below the surface of the soil; and when full-fed, in spring, they make earthen cocoons, and become pupæ in the soil. *T. Ianthina* (Lesser Broad-bordered Yellow Underwing) has an expanse of wing of about $1\frac{1}{2}$in. The front wings are rich brown, with purple tints, and three wedges of grey extending inwards from the front margin. The hind wings have the base black, and the broad, marginal band intense velvety-black; the crest of each wing is orange. The larvæ feed in Primroses, and in other garden flowers, during winter, and become pupæ, in spring, in cocoons in the soil. *T. interjecta* (Least Yellow Underwing) reaches only about $1\frac{1}{4}$in. in span. The front wings are rusty-brown or dull red, with darker lines, and a smoky band near the hind margin. The hind wings are dark at the base, with a smoky-black marginal band, a similar shade along the inner margin, and a dark spot in the yellow median area. The larvæ feed on low plants, such as Dock and other weeds, in winter and spring, like those already mentioned. *T. fimbria* (Broad-bordered Yellow Underwing) has a spread of wings of 2in. to $2\frac{1}{4}$in. It is easily known by its size, and by the very broad, intensely black marginal band, and the deep orange, unspotted area (extending to the base) of the hind wings. The larvæ feed in autumn on leaves of Birch, Sallow, and other trees, hybernate, and in spring eat the young leaves of the same trees, crawling down the trunk before daylight appears, and hiding in the ground all day, to crawl up again in the evening. *T. orbona* (Lesser Yellow Underwing) varies in spread of wings from $1\frac{1}{2}$in. to $1\frac{3}{4}$in. The front wings vary in depth of colour. The hind wings are yellowish, clouded with grey at the base, and have a dark grey, crescentic spot in the middle, and a rather narrow, blackish marginal band. The larvæ feed in autumn on Chickweed and other low plants; but, after hybernation, in spring they ascend the stems of Hawthorn and Sallow, and eat the young leaves. *T. subsequa* is too uncommon to call for special mention here.

Remedies. These should be employed as recommended against **Noctua** (which *see*).

TSIANA. A synonym of **Costus** (which *see*).

TSUGA (the Japanese name for these trees). ORD. *Coniferæ.* A small genus (eight species) of hardy, evergreen trees, with the ultimate branches slender and often pendulous; three are North American, and two Asiatic. Flowers monœcious; males sub-sessile, solitary in the axils of the upper leaves; female catkins solitary, terminal, globose, with few empty, stipitate scales. Leaves acicular or narrow-linear, spirally scattered, sometimes distichously spreading, flat or (in one species) convex above. Cones sub-globose, often reflexed, 1in. or less in length, or (in one species) rather longer. The species of this genus are often confused with those of *Abies.* For culture, *see* **Pinus.**

T. Brunoniana (Brown's). *l.* solitary, somewhat distichous or scattered, flat, linear, spreading, obtuse or slightly pointed, minutely toothed towards the apex, reflexed on the margins, glossy-green above, milky-mealy below. *cones* terminal, 1in. long, solitary, sessile. Branches numerous, slender, pendent. *h.* 70ft. to 80ft. Bhotan. (G. C. n. s., xxvi., pp. 73, 501.) SYNS. *Abies Brunoniana, A. dumosa.*

T. canadensis (Canadian).* Hemlock Spruce. *l.* solitary, flat, irregularly distichous, $\frac{1}{2}$in. to $\frac{2}{3}$in. long, downy when young, rough at the margins, blunt, vivid light green above, with two silvery stripes beneath. *cones* pendulous at the tips of the branches, $\frac{1}{2}$in. to $\frac{3}{4}$in. long, oval. Branches numerous, slender and downy when young, spreading, rather flat. *h.* 60ft. to 80ft. North America, 1736. SYN. *Abies canadensis.* The following varieties are enumerated by Gordon, in "The Pinetum":

FIG. 116 BRANCH, CONE, AND SEED OF TSUGA ROEZLII.

T. c. alba-spica (white-spiked). A rather pretty form, differing from the type in having the leaves on the ends of the young growth of a whitish colour.

T. c. gracilis (slender). *l.* linear, blunt-pointed, glossy above, glaucous beneath, more or less obliquely placed all round the shoots, and seldom more than $\frac{1}{4}$in. long. Branches and branchlets very slender, little divided, more or less drooping at the ends.

T. c. milfordensis (Milford). A dwarf variety, globular in form, with the shoots slender and drooping, and the leaves much smaller than those of the type; but it is quite distinct from *gracilis.*

T. c. nana (dwarf). A dwarf variety, not exceeding 3ft. in height, and spreading on the ground, with a more tufted foliage than the type.

Tsuga—*continued.*

T. caroliniana (Carolina). *l.* larger, wider, and darker-coloured than in *T. canadensis*, six to ten lines long, and nearly one line broad, retuse or often notched at the ends. *cones* also larger, ten to sixteen lines long, the scales oblong, longer than wide, spreading when ripe at nearly right angles, the broad bracts slightly cuspidate, the seeds less than half the length of the narrow wing. *h.* 50ft. to 60ft. North Carolina, 1886. A compact, pyramidal tree, with flattened spray. (G. C. n. s., xxvi., p. 781.)

T. Hookeriana (Hooker's).* *l.* closely set, linear, mucronate, and erect, of a pale, slightly glaucous tint. *cones* ovoid-cylindrical, 1½in. to 2in. long, ½in. wide, pendent, dark purple, when ripe pale fawn-coloured; scales coriaceous-imbricated; bracts short, persistent. California, 1854. A very graceful tree, thickly branched, and very distinct.

T. Mertensiana (Mertens').* Very similar to *T. canadensis*, distinguished by its shorter, slenderer leaves, more robust and rapid growth, more spreading branches, and deeper, red-coloured bark; and also by the more elongated scales of its cones and the proportionately longer wings of the seeds. *h.* 100ft. to 150ft. California, 1851. SYN. *Abies Mertensiana.*

T. Pattoniana (Patton's).* Californian Hemlock Spruce. *l.* angular, acutish, attenuate at the base, often curved, ½in. to 1in. long. *cones* cylindrical-oblong, 2in. to 3in. long. Sierra Nevada, 1851. Described by Dr. Engleman as "a tall, strictly pyramidal tree, 100ft. to 150ft. high, and 2ft. to rarely 4ft. through, of graceful habit, with slender, pubescent branchlets, and light green foliage." SYN. *Abies Williamsoni.*

T. Roezlii (Roezl's). *l.* scattered, short, slightly twisted, flat above, rounded beneath, green on both surfaces. *cones* about 2in. long, with large, entire, thin scales; seeds deep red, very small, with a large, membranous wing. Branches pendulous. *h.* 50ft. to 60ft. North California. A curious species, with the habit of *Cedrus Deodara.* See Fig. 116. (R. H. 1870, 21.)

T. Sieboldii (Siebold's).* *l.* solitary, somewhat distichous, thickly set on the branches, frequently alternate, flat, slightly linear, obtuse, rarely acute, entire, dark green above, with two white-glaucous bands beneath. *cones* terminal, 1in. long, elliptic, blunt. Branches irregularly spreading, drooping at the ends; branchlets slender, recurved. *h.* 80ft. to 100ft. Japan. SYN. *Abies Tsuga.*

TUBÆFORM. Hollow and dilated at one extremity, like the end of a trumpet.

TUBE. The part of a gamosepalous calyx, or gamopetalous corolla, formed by the union of the edges of the sepals or petals. A staminal Tube is formed from the cohesion of the filaments in monadelphous flowers.

TUBEFLOWER. A common name for **Clerodendron Siphonanthus** (which *see*).

TUBER. A roundish, underground, succulent stem, covered with buds or "eyes," from which new plants or Tubers are produced; *e.g.*, the Potato. A receptacle of vegetable food.

TUBER. *See* **Truffles.**

TUBERCLED. Covered with small warts or excrescences.

TUBERCULE. A term applied to simple roots which acquire a succulent consistency, become reservoirs of vegetable food, and serve for propagating purposes, in consequence of being terminated by a bud. A little tuber.

TUBEROSE. *See* **Polianthes tuberosa.**

TUBER ROOT. A common name for **Asclepias tuberosa** (which *see*).

TUBS. Wooden Tubs are sometimes used for large plants, such as Palms, Oranges, Tree Ferns, &c. It is important that good drainage should be provided, and porous soil used at first, as the roots cannot be examined very readily afterwards. Trees in Tubs will often remain for several years without the soil being renewed, if watering is properly attended to, and an occasional top-dressing is given.

TUCKERMANNIA. A synonym of **Corema** (which *see*).

TULBAGHIA (named after Tulbagh, a Dutch governor at the Cape of Good Hope, who died in 1771). SYN. *Omentaria.* ORD. *Liliaceæ.* About a dozen species have been referred as such to this genus, but Baker accords this rank to nine only. They are mostly greenhouse, rhizomatous, perennial herbs, with a garlic-like odour, inhabiting South and tropical Africa. Flowers numerous, in a terminal umbel, pedicellate; perianth urceolate or nearly salver-shaped, with six sub-equal, spreading lobes; corona rather fleshy at the throat, shorter than the lobes; stamens six; involucral bracts two, scarious, broad; scape simple, leafless. Leaves radical, ligulate, the withered sheath sometimes forming, with the rhizome, an imperfect corm. The species known in gardens are described below. They are interesting subjects when in flower. Sandy loam and peat form the most suitable compost for Tulbaghias. Propagation may be effected by offsets, or by seeds.

T. affinis (related). A form of *T. alliacea.*

T. alliacea (Onion-scented). *fl.*, perianth greenish-purple, five to six lines long; corona obscurely red, fleshy, entire or crenate; umbels four to twelve-flowered; scapes 9in. to 18in. long. June. *l.* five or six, 6in. to 9in. long, two to three lines broad. 1820. (Ref. B. 349.)

T. a. affinis (related). *fl.*, perianth segments half the length of the tube, narrower. *l.* 1ft. or more long, three to six lines broad. Altogether a more robust plant than the type. SYN. *T. affinis.*

T. a. Ludwigiana (Ludwig's). *fl.*, scape 1½ft. to 2ft. long. *l.* lorate, 6in. to 8in. long, eight to nine lines broad. SYN. *T. Ludwigiana* (B. M. 3547).

T. alliacea (Onion-like), of Sims. A synonym of *T. capensis.*

T. capensis (Cape). *fl.*, perianth greenish-purple, the segments half the length of the tube; staminodia obscurely purple, deeply emarginate; umbels six to eight-flowered; scapes 1½ft. to 2ft. high. June. *l.* ten to twelve, 1ft. or more long, four to six lines broad. 1774. (B. M. 806, under name of *T. alliacea.*)

T. Ludwigiana (Ludwig's). A form of *T. alliacea.*

T. violacea (violet). *fl.*, perianth purplish-violet, eight to nine lines long, the segments lanceolate, half the length of the cylindrical tube; staminodia ligulate, emarginate; umbels eight to twenty-flowered; scapes 1ft. to 2ft. long. March. *l.* six to ten, green, 8in. to 12in. long, two to three lines broad. 1838. (B. M. 3555.)

TULIP. *See* **Tulipa.**

TULIPA (the Italian rendering of the Turkish *tulbend*, a turban, which the flower resembles). Dalmatian Cap; Tulip. Including *Orithyia.* ORD. *Liliaceæ.* A genus comprising, according to Mr. Baker, upwards of sixty species of very beautiful, hardy, bulbous plants, inhabiting Europe, North Africa, Western and Central Asia, and extending as far as Japan. Flowers erect or very rarely nodding, showy; perianth deciduous, campanulate or nearly funnel-shaped; segments distinct, erect or erecto-patent, sub-equal, often spotted inside near the base; stamens six, hypogynous, shorter than the perianth; filaments more or less complanate, attenuated or shortly filiform at apex; anthers oblong-linear, erect, the cells laterally dehiscing. Leaves linear or rather broad. Stem simple, few-leaved, one, or rarely two or three, flowered. Bulb tunicated, the tunics sometimes woolly within. "In the middle of the seventeenth century, Tulips became the object of a trade such as is not to be met with again in the history of commerce, and by which their price rose above that of the most precious metals. It is a mistake, however, to suppose that the high prices paid for bulbs—amounting, in some instances, to 2,500 and even 4,600 florins—represented the estimated value of a root, since these large sums often changed hands without any transfer of property. Bulbs were bought and sold without being seen—without even being in existence. In fact, they were the subject of a speculation not unlike that of railway scrip in this country at no very distant date" (Lindley and Moore). Tulips still take front rank amongst the most familiar and beautiful of hardy, bulbous plants. Many hundreds of varieties have been raised by means of careful hybridisation; and they are mostly offered at prices that place them within the reach of the average amateur gardener.

Propagation. New varieties of Tulips are obtained

Tulipa—*continued.*

from seeds, and some of the species which increase but slowly by offsets may be similarly raised. The most general method of propagation for perpetuating varieties is that of offsets, which are generally produced in fair quantities. Seeds may be sown in boxes of light, sandy soil, about February, and placed in a cold frame, where they will germinate in due course, and may be protected during the following winter. The next season the young bulbs should be planted in a prepared bed outside, for growing on into a flowering size. This takes four or five years, and the first flowers which appear are usually self-coloured; after another period, the length of which is quite an uncertainty, these flowers, which at the first are called "breeders," break into other colours and markings, which admit of their being placed into one or another of the several classes adopted. The process of raising flowering bulbs of Tulips from seed is, therefore, a very slow one. Offsets may be detached from established bulbs, when they are lifted, and grown by themselves until large enough for flowering. The chief supplies of Tulips are imported from Holland, where,—with other, commonly called, Dutch bulbs—they are grown in immense quantities for exportation to all parts of the world. When young seedlings and offsets are raised in gardens, they should be planted in a border or bed prepared with sandy loam, leaf mould, and light manure, and provided with efficient drainage, which, if possible, should be secured by selecting a position where the subsoil is gravelly. A situation exposed to sun and air is preferable, but sheltered from rough winds, which blow the plants about, and break their leaves.

Cultivation. Planting of all kinds of Tulips is best performed in October, and early in November; the bulbs should be placed from 3in. to 4in. deep, to preserve them against injury from severe frost; a little sand round each is generally recommended, but in light, sandy soil this need not be considered absolutely essential—except, perhaps, with scarce sorts or valuable seedlings. Planting with a trowel is best, as the soil is better adapted for the roots to enter than when a dibber is used. A distance of 6in. between the bulbs is sufficient; but when there are not many to be planted they may be more widely disposed. In the spring, so soon as the flowers begin to expand, a light awning placed over the bed will preserve those of any particular variety for a longer period than if they were exposed; but flower-beds filled with Tulips for a spring display cannot receive such attention. The bulbs may be lifted after the foliage turns brown and the stalks become limp, and placed in a cool, airy place, not in the sun. When thoroughly ripened, they may be stored in drawers or bags, where provision can be made for air circulating amongst them, until planting time again arrives. If it becomes necessary to lift the bulbs to clear flower-beds for summer occupants, they should be planted again in reserve beds, and allowed to ripen there.

The arrangement of colours, and the selecting of showy varieties which flower at about the same period, are matters of great importance in planting beds of Tulips. Both single and double kinds succeed admirably, but preference must be accorded the former, which are very distinct and beautiful.

For pot-culture and forcing, Tulips—at least, the early-flowering varieties—are invaluable. So soon as the annual consignments arrive from Holland, the supply for the season should be procured, and a portion potted. From three to five bulbs, according to size, are requisite for a 5in. pot, and a compost of two parts loam to one of light manure, with some sand intermixed, is suitable. Afterwards plunge the pots in ashes or cocoa-nut fibre outside, and introduce into gentle heat when the bulbs are well rooted, and begin to push their shoots. Successional supplies should be similarly treated, according to requirements, and the quantity of bulbs at command.

Tulipa—*continued.*

The species here described are those best known in gardens, and are based on Mr. Baker's admirable monograph of the genus, which appeared in the "Gardeners' Chronicle" for 1883. His synopsis of the species, adjusted to the requirements of this work, is given below.

Sub-genus I. Tulipa proper.

Ovary with a sessile stigma.

SECTION 1. ERIOBULBÆ. Perianth bright red; filaments without a tuft of hairs at the base. Lower leaf usually oblong-lanceolate. Outer bulb coats densely coated inside with soft, intertangled, cottony hairs.

maleolens
montana
Oculus-solis
præcox

SECTION 2. CLUSIANÆ (type, *T. Clusiana*). Flowers mainly white, between funnel-shaped and campanulate; filaments without a tuft of hairs at the base. Leaves narrow and grass-like. Outer bulb coats densely hairy inside.

Clusiana
stellata

SECTION 3. GESNERIANÆ (type, *T. Gesneriana*). Perianth usually bright red, campanulate; filaments without a tuft of hairs at the base. Lower leaf broad, with two or three exceptions. Bulb coats glabrous, or with only a few adpressed hairs inside. This is the largest section of the genus, and the one to which all the species most valuable for garden purposes belong. It may be best divided into groups by characters derived from the shape of the perianth segments and the vestiture of the peduncles:

Group 1. Perianth segments all uniform and acuminate.

acuminata
elegans
retroflexa

Group 2. Perianth segments all, or the three outer, oblong, acute; peduncle glabrous.

brachystemon
cruciata
Didieri
Elwesii
Kesselringii
Kolpakowskiana
triphylla
undulatifolia

Group 3. Perianth segments all broadly rounded at the apex, with a small cusp in the centre; peduncle glabrous.

Borsczowi
Gesneriana
macrospeila
Ostrowskiana

Group 4. Perianth segments all narrowed to an acute point.

altaica
Kaufmanniana
strangulata
suaveolens

Group 5. Perianth segments all obtuse; peduncle permanently pubescent.

Alberti
Eichleri
Greigi
iliensis
maculata
pubescens

SECTION 4. SAXATILES. Perianth red or lilac; filaments furnished with a tuft of hairs at the base. These are a little group of fine species, all belonging to the oriental flora, and all, as yet, little known in cultivation.

Aucheriana
Hageri
pulchella
saxatilis

SECTION 5. SYLVESTRES. Perianth always yellow or yellowish-white; filaments with a tuft of hairs at the base. The species of this section have been comparatively little cultivated, and are of much less interest from a horticultural point of view than those of any of the foregoing. They may be divided into three groups by the colour of the flower:

Group 1. Flowers bright yellow, flushed with green on the outside.

Biebersteiniana
fragrans
Grisebachiana
sylvestris

Tulipa—*continued.*

Group 2. Perianth bright yellow, flushed with red on the outside.

australis
humilis
Orphanidea

Group 3. Perianth pale yellow or whitish inside, tinged with green or reddish outside.

biflora
patens
primulina
turkestanica

Sub-genus II. Orithyia.

Ovary narrowed gradually into a distinct style, which is tipped with three small stigmas. The species of thus sub-genus are all dwarf, small-flowered, fragile plants, of little horticultural interest, natives of Siberia, China, and Japan. They may be arranged in three groups, according to leafage:

Group 1. Leaves two, sub-opposite, placed about the middle of the stem.

uniflora

Group 2. Leaves three, crowded near the base of the stem.

thianschanica

Group 3. Leaves, two large ones low down on the stem, and two to four small ones near each flower.

edulis

FIG. 117. TULIPA ACUMINATA, showing Habit and detached Flower.

T. acuminata (acuminate). Turkish Tulip. *fl.*, perianth variable in colour, 3in. to 4in. long, the segments all alike, narrowed gradually into a very long point; peduncle glabrous. April. *l.* (and bulb) as in *T. Gesneriana*. Native country unknown. A distinct type. See Fig. 117. SYN. *T. cornuta* (B. R. 127).

T. Alberti (Albert Regel's). *fl.*, perianth orange-scarlet, the base faintly blotched with red-brown on a yellow groundwork, campanulate, 2in. long, the three inner segments obtuse, the three outer sub-acute; filaments yellow, exceeding the dark purple anthers; peduncle erect, pubescent, 6in. to 9in. long. April. *l.* glaucous-green, lanceolate, without blotches. *h.* 2ft. Central Asia, 1877. (B. M. 6761; R. G. 912.)

T. altaica (Altaian). *fl.*, perianth usually yellow, rarely red, 1in. to 1½in. long in wild specimens, the segments oblong and decidedly acute, without any basal blotch; peduncle pubescent, 3in. to 4in. long. April. *l.* usually three, the lowest lanceolate, about 1in. broad. Stem 6in. to 9in. long. Bulb ¾in. to 1in. in diameter, the outer tunics without any hairs inside. South-central Siberia. The red-flowered variety is figured in R. G. 942.

T. Aucheriana (Aucher Eloy's). *fl.* strongly fragrant; perianth oblong-infundibular, 1in. to 1¼in. long, all the segments mauve-lilac, nearly alike, oblong, acute, ½in. broad, with a bright yellow claw; stamens ¾in. long, the yellow filaments twice as long as the anthers, densely hairy at base; peduncle slender, glabrous. April. *l.* three or four, linear, glabrous, acute, 4in. to 6in. long, ½in. broad, gradually narrowed from the middle to the base and apex. Stems 4in. to 8in. long, slender, glabrous, one-headed. Bulb ovoid, medium-sized. Teheran, 1880.

T. australis (Southern).* This is distinguished from *T. sylvestris* by its more funnel-shaped perianth, flushed with red on the outside, 1in. to 1½in. long, its narrower leaves, and its more slender habit. Savoy. SYNS. *T. Breyniana* (B. M. 717), *T. Celsiana*. *T. humilis* is a dwarf species closely allied to *T. australis*; it is a native of the mountains of Persia.

T. Biebersteiniana (Bieberstein's). This resembles *T. sylvestris*, but the perianth is smaller and more funnel-shaped, and the plant is less robust in habit. Asia Minor, Siberia, &c., 1820.

Tulipa—*continued.*

T. biflora (two-flowered). *fl.*, perianth white inside, with a yellow eye, tinged green outside, oblong, infundibular, the segments oblong, acute; anthers minute. April. *l.* two or three, ¼in. to ½in. broad. Stems 3in. to 6in. long, with often two or three, rarely four or five, flowers. Bulb ovoid, the outer tunics woolly outside. Caucasus, 1806. This is a connecting link between the sub-genus *Orithyia* and the true Tulips. (B. M. 6518; B. R. 535; R. G. 239.)

T. Bonarotiana (Buonarotti's). A form of *T. strangulata.*

T. Borszczowi (Borszczow's). *fl.*, perianth bright red, 1ft. to 1½ft. long, all the segments obovate-oblong, obtuse, with a cusp at the tip, and furnished with a large, brown-black, basal blotch, margined with yellow, as in *T. Oculus-solis*; peduncle glabrous. Spring. *l.* four, with a distinct, cartilaginous, very crisped border, the lower one lanceolate. Dwarfer than *T. Gesneriana*. Central Asia. (R. G. 1175.) The form figured in B. M. 6635 has the flowers yellow without any basal blotch.

FIG. 118. TULIPA GESNERIANA.

T. brachystemon (short-stamened). This is very near *T. Kesselringii*, from which it is said to differ by the flower being smaller with more acute segments, and the leaves being narrower and only two in number. Turkestan. (R. G. 1099, fig. 2.)

T. Breyniana (Breyne's). A synonym of *T. australis.*

T. Celsiana (Cels'). A synonym of *T. australis.*

T. camptopetala (flexible-petaled). A form of *T. Didieri.*

T. Clusiana (Clusius').* Lady Tulip. *fl.*, perianth delicate white, flushed with red on the outside, with a conspicuous, purplish-black base, middling-sized; anthers and filaments black. July. *l.* four or five, long-linear, acuminate, channelled. Stem slender, 1ft. to 1½ft. long. Bulb small, densely pilose. Mediterranean region, 1636. (B. M. 1390; S. F. G. 329.)

T. cornuta (horned). A synonym of *T. acuminata.*

Tulipa—*continued.*

T. cruciata (cruciate). *fl.*, perianth bright cherry-red inside, campanulate, 1¼in. to 1½in. long, the outer segments acute, the inner obtuse, both having a large, black blotch with a yellow border filling up the whole claw; stamens black, ½in. long; peduncle obscurely glandular-pubescent. Spring. *l.* four or sometimes five, crowded, spreading, linear; lowest 6in. to 9in. long, ½in. broad. Bulb middle-sized, with a long neck. Asia Minor, 1874.

T. Didieri (Didier's). *fl.*, perianth bright red, campanulate, 2in. to 2½in. long, with a black blotch ½in. to ¾in. long, and having a yellow or whitish border covering the whole of the claw; the three outer segments oblong, acute, the three inner ones more obovate and obtuse; stamens blackish-purple, the anthers equalling in length the glabrous filaments. May. Bulb-coats scarcely hairy inside. Stature, leaves, and peduncle, as in *T. Gesneriana*. Alps. (B. M. 6639.) SYN. *T. Fransoniana.*

T. edulis (edible). *fl.*, perianth pale yellow, sometimes flushed with red, strongly tinged with green on the outside, funnel-shaped, ¾in. to 1in. long, all the segments acute. May and June. *l.*, two lower ones linear, flaccid, 6in. to 12in. long; two below each flower small, linear, erecto-patent. Stem slender, 3in. to 9in. long, one to three-headed. Bulb ovoid, the outer tunics densely woolly inside. Japan.

T. Eichleri (Eichler's).* *fl.*, perianth bright crimson, having a distinct, black blotch spread over the whole claw, with a yellow border; segments obovate, obtuse. April and May. Georgia, 1874. This fine plant closely resembles *T. Gesneriana*, but differs in having a pubescent peduncle. (B. M. 6191; R. G. 799.)

FIG. 119. TULIPA GESNÉRIANA DRACONTIA, showing Habit and detached Flower.

T. elegans (elegant).* *fl.*, perianth bright red, campanulate, with a yellow eye, the six nearly uniform, oblong segments gradually narrowed to a very acute point; stigma moderately large; peduncle finely downy. End of April. Probably a hybrid between *T. acuminata* and *T. suaveolens.*

T. Elwesii (Elwes'). *fl.*, perianth bright scarlet, erect, campanulate, 1½in. long, all the segments having a small, black blotch with a yellow margin filling up the whole claw, the three outer ones oblong, acute, the three inner ones obovate; stamens dark purple; peduncle erect, glabrous. Early in April. *l.* three, rather glaucous, glabrous; lowest lanceolate, 5in. to 6in. long, ½in. to ¾in. broad, concave down the face above; two upper much smaller, linear. Stem slender, 6in. to 8in. long. Bulb ovoid, ½in. in diameter; tunics dark brown, glabrous inside. Teheran. (R. G. 1147.)

T. fragrans (fragrant). A synonym of *T. sylvestris.*

T. Fransoniana (Franson's). A synonym of *T. Didieri.*

T. fulgens (brilliant). A form of *T. Gesneriana.*

T. Gesneriana (Gesner's).* *fl.*, perianth large, campanulate, the segments variable in colour, when bright red having only an obscure basal blotch, broadly rounded at the apex; stigmas crisped, ½in. in diameter; peduncle glabrous, erect. May and June. *l.* (in a wild state) three or four (often more numerous when growing vigorously under cultivation), broad. Bulb large, the outer coats having a few adpressed hairs on the inside. *h.* 2ft. Levant, &c., 1577. "This is evidently the original stock of most of the late-flowering garden forms" (Baker). See Fig. 118. (B. R. xxiv. 46; F. & P. 537, under name of *T. G. Strangwaysii.*) SYN. *T. Schrenki* (B. M. 6439). *T. fulgens* is a form having bright scarlet flowers with a yellow eye and yellow stamens. The variable race of Parrot Tulips are referred to *T. G. Dracontia.* See Fig. 119. (F. d. S. 2211, under name of *T. turcica.*)

T. G. spathulata (spathulate).* This differs from the type in its larger flowers, of a brilliant-red colour, with a large, purplish-black botch at the base of each of the segments. Italy. Probably the largest of all the wild Tulips. SYN. *T. spathulata.* This is catalogued by many bulb-growers as *T. G. vera.*

T. G. Strangwaysii (Strangways'). A synonym of *T. Gesneriana.*

T. G. vera. *See* **T. G. spathulata.**

Tulipa—*continued.*

An enormous number of garden forms, both double and single, varying most widely in colour, have originated from *T. Gesneriana.* See Figs. 120, 121, 122, and 123.

FIG. 120. FLOWERS OF TULIPA GESNERIANA FLAMANDE.

FIG. 121. TULIPA GESNERIANA FLORE-PLENO, showing Habit and detached Flower.

FIG. 122. TULIPA GESNERIANA GRAND PIED, showing Habit and detached Flower.

T. Greigi (Greig's).* *fl.*, perianth bright flame-red, campanulate, 2½in. to 3in. long, all the segments very obtuse and furnished with a very distinct, linear-oblong, black blotch, sometimes 1in.

Tulipa—*continued.*

FIG. 123. TULIPA GESNERIANA HATIVE, showing Habit and detached Flower.

long, with a yellow border; stigma large; anthers bright yellow; peduncle pubescent. April. *l.* broad-oblong, glaucous, with numerous distinct, brown blotches. *h.* 9in. Turkestan, 1873. A showy and robust species. See Fig. 124. (B. M. 6177; F. d. S. 2261; F. & P. 1876, 217; R. G. 773.)

FIG. 124. TULIPA GREIGI, showing Habit and detached Perianth Segments.

T. Grisebachiana (Grisebach's). *fl.* faintly scented; perianth of a lemon-yellow colour, less than 2in. long; peduncle 1ft. long, one-flowered, glaucous. Spring. *l.* three, very glaucous, erect, 6in. to 7in. long, ½in. to ¾in. broad, concave. Bulb ovoid, the outer tunics brown, glabrous. Herzegovina, 1884. Closely allied to *T. sylvestris.*

T. Hageri (Hager's). *fl.*, perianth campanulate, 1½in. to 2in. long, the segments bright red, often tinged with yellow outside, oblong, acute, ½in. to ¾in. broad, furnished with a large, rhomboid, blue-black blotch on the claw, with a yellow border; stamens purplish-black, under 1in. long; filaments densely pilose at base; peduncle glabrous, stiffly erect. April. *l.* three or four, linear, green, acute, channelled down the face, the lowest 6in. to 8in. long, ½in. broad. Stem one-headed, 1ft. long. Bulb ovoid, middle-sized. Attica, 1874. (B. H. 1877, 2; B. M. 6242; R. G. 790.)

T. humilis. *See* **T. australis.**

T. iliensis (Trojan). Cowslip-scented Tulip. *fl.*, perianth lemon-yellow, not more than 1in. long, all the segments obtuse; stigma minute; filaments twice as long as the yellow anthers; peduncle slender, pilose. Spring. *l.* four, linear, aggregated near the base of the peduncle, all under ½in. broad. Bulb small, ovoid, the outer tunics slightly pilose inside. Central Asia, 1879. (B. M. 6518, B; R. G. 975, 982.)

Tulipa—*continued.*

T. Kaufmanniana (Kaufmann's). *fl.*, perianth bright yellow, slightly tinted with red outside towards the top, nearly 3in. long; the segments oblong, acute, without any basal blotch; peduncle erect, downy, 5in. to 6in. long. Spring. *l.* three, glaucous; the lowest oblong-lanceolate, 1½in. to 2in. broad. Stature of *T. Gesneriana.* Central Asia, 1877. (B. M. 6887; R. G. 906, figs. 6-10.)

T. K. albo-variegata (white-variegated). *fl.*, perianth white inside, yellow towards the base, with the back of the three outer segments rose-coloured and white-margined. 1877.

T. K. luteo-variegata (yellow-variegated). *fl.*, perianth pale yellow inside, with a red spot below the middle, the three outer segments rose-coloured on the back, with yellow margins. 1877.

T. Kesselringii (Kesselring's). *fl.*, perianth bright yellow, oblong, 1½in. to 2in. long, the six segments all oblong and sub-acute, the three outer flushed with red down the back; stamens bright yellow; peduncle obscurely puberulent. April. *l.* four, linear, channelled, glabrous, not undulated, the lowest 6in. long. Dwarfer than *T. Gesneriana*, with a smaller bulb, the outer tunics of which are slightly rugose inside. Turkestan, 1879. (B. M. 6754; R. G. 964.)

T. Kolpakowskiana (Kolpakowski's). *fl.*, perianth faintly scented, campanulate, 2in. to 2½in. long, all the six segments varying from bright scarlet to bright yellow, when red having only a small, black-yellow blotch at the base without any distinct border, oblong, acute, the three outer ones spreading away from the three inner; filaments in the red-flowered form glabrous, shorter than the dark purple anthers; peduncle 6in. to 9in. long, obscurely pubescent. April. *l.* three or four, lanceolate, the lower 1ft. long, with a minutely ciliated margin. *h.* 2ft. Central Asia, 1577. A fine species. (B. M. 6710; G. C. n. s., xiii., p. 652; R. G. 951.)

T. macrospeila (broad-stained).* *fl.*, perianth bright crimson, campanulate, 2½in. to 3in. long, all the six segments decidedly obtuse, 1¼in. to 1½in. broad, having a large, distinct, nearly black, cuneate blotch, with a broad, yellowish-white border, filling up the whole claw; stamens black, one-third the length of the perianth; stigmas ¼in. in diameter, much crisped; peduncle glabrous. May. Habit of *T. Gesneriana.* Origin unknown; probably a hybrid between *T. Gesneriana* and some other species.

T. maculata (spotted). A well-marked, garden race, with the habit of *T. Gesneriana*, from which it differs by its bright red perianth segments. with a broad, black basal blotch, small stigma, and pubescent peduncle. End of May

T. maleolens (strong-smelling). This "agrees with *T. Oculus-solis* in bulb, leaves, stature, and peduncle; but the black blotch at the base of the perianth segments covers the whole claw" (Baker). The flowers have a faint, unpleasant scent. Italy, 1827. (B. R. 1839, 66.) *variegata* is a variegated form. (S. B. F. G. ser. ii. 153.)

T. montana (mountain-loving). *fl.*, perianth bright red, erect, 1½in. to 2in. long, with oblong, acute outer, and often obovate, obtuse inner, segments, with a very distinct, black basal blotch; peduncle glabrous. July. *l.* three or rarely four, often curved and much crisped at the edges; lowest at most 6in. long, and about 1in. broad. Stems about 6in. long. Bulb large, ovoid. Persia, &c., 1826. (B. R. 1106.) There are several varieties of this species, exhibiting marked differences in the colour of the flowers.

T. neglecta (neglected). A form of *T. strangulata.*

T. Oculus-solis (sun's-eye).* *fl.* scentless; perianth 2½in. to 3in. long; segments bright red, having a great, oblanceolate, black blotch, 1in. or more long, with a yellow border, in the centre of the base. April. *l.* three or four; lowest 1ft. long when fully developed, 1½in. broad. Stem 1ft. to 1½ft. high. South of France, 1816.

T. Orphanidea (Orphanides'). *fl.*, perianth bright yellow, 2in. to 3in. long, the acute segments tinged with red on the outside; anthers oblong, ¼in. long; peduncle long, one-headed. May. *l.* three, linear, channelled. Stem 1ft. to 2ft. long. Mountains of Greece, 1862. (B. M. 6310; R. G. 373.)

T. Ostrowskiana (Ostrowski's). *fl.*, perianth bright red, 2in. or more in diameter, each of the segments having a black spot at the base; filaments very short, dilated, and, as well as the anthers, purple. Spring. *l.* linear-lanceolate, glaucescent. Turkestan, 1884. Closely allied to *T. Oculus-solis.* (B. M. 6895; R. G. 1144, figs. 1, 2.)

T. patens (spreading). *fl.*, perianth whitish, oblong-infundibular, ¾in. to 1in. long, with a yellow eye inside, tinged green outside; stamens half as long as the perianth. April. *l.* two or three, ¼in. to ½in. broad. Stems 3in. to 9in. long, usually one, rarely two, flowered. Bulb-tunics obscurely pilose inside upwards. Central Siberia, 1817. SYNS. *T. sylvestris tricolor* (R. G. 827), *T. tricolor* (B. M. 3887).

T. præcox (early).* This "cannot be regarded as distinct specifically in a broad sense from *T. Oculus-solis*, from which it differs in its more robust habit of growth, earlier flowering, and ovate, more imbricated perianth segments, with a less clearly marked basal blotch" (Baker). Italy, 1825. (S. B. F. G.

Tulipa—*continued.*

157; B. R. 380, under name of *T. Gesneriana;* B. R. 204, 1143, 1419, under name of *T. Oculus-solis.*)

T. primulina (Primrose-like). *fl.* strongly scented; perianth pale primrose-yellow, funnel-shaped, 1in. long; outer segments lanceolate, tinged with bright red all over the back; inner oblong; peduncle glabrous, 2in. to 3in. long. Spring. *l.* four to six, crowded near the surface of the ground, linear, green, glabrous, channelled down the face, the outer ones 3in. to 4in. long. Stem less than 6in. above the surface, one-flowered. Bulb ovoid, 1in. thick, with bright red-brown outer tunics. Eastern Algeria, 1882. (B. M. 6786.)

T. pubescens (downy).* *fl.* faintly scented; perianth widely varying in colour. This is probably a hybrid between *T. Gesneriana* and *T. suaveolens.* It has the large stigma and six obtuse segments of the former, and the downy peduncle of the latter; the bright red forms have no blotch at the base of the perianth segments. (S. B. F. G. 78; B. M. 2388, under name of *T. suaveolens latifolia.*) To this belong several of the April-flowering garden races, such as BRIDE OF HAARLEM, DUKE OF YORK, and POTTEBAKKER.

T. pulchella (pretty). *fl.*, perianth funnel-shaped, 1½in. long; segments mauve-red in the upper two-thirds, nearly uniform, oblong, acute, the claw slate-violet, with a yellow base; filaments whitish, densely pilose at base; peduncle slender, glabrous, 1in. to 2in. long. April. *l.* three, crowded near the surface of the ground, green, channelled down the face, obscurely ciliated; outer one about 3in. long and ½in. broad, the inner ones narrower. Bulb ovoid, 1in. in diameter; outer tunics rigid, dark chestnut-brown. Cilician Taurus, 1877. (B. M. 6304.)

T. retroflexa (retroflexed).* *fl.*, perianth bright yellow, about 3in. long, with six uniform, oblong segments, narrowed gradually to an acute point; stamens yellow. Early in May. A garden plant, probably a hybrid between *T. acuminata* and *T. Gesneriana.*

T. saxatilis (rock-loving). *fl.* faintly Primrose-scented; perianth oblong-infundibular, 2in. to 2½in. long; segments bright mauve-purple in the upper two-thirds, and bright yellow on the claw, without any spot, the inner ones obovate-cuspidate, 1½in. broad, the outer oblong, less than 1in. broad; stamens nearly 1in. long; filaments bright yellow, twice the length of the blackish anthers; peduncle glabrous. March. *l.* three or four, lanceolate or linear, glabrous, the lowest above 1ft. long, 1in. to 1½in. broad. Stems 1ft. or more long, often two-headed. Bulb medium-sized, ovoid. Crete, 1827. (B. M. 6374.)

T. Schrenki (Schrenk's). A synonym of *T. Gesneriana.*

T. spathulata (spathulate). A synonym of *T. Gesneriana spathulata.*

T. stellata (star-like). A near ally of *T. Clusiana,* with similar leaves and habit, but the perianth segments are more obtuse, and without the distinct purplish-black eye. February. Himalayas, 1827. (B. M. 2672.) There is a bright yellow variety, with the flower sometimes self-coloured, sometimes flushed with red on the outside.

T. strangulata (constricted). *fl.*, perianth segments furnished at the base with a large, black blotch, both in the typical red-flowered form, and also in some of the yellow varieties. April. This is very like *T. suaveolens,* but much taller. *T. Bonarotiana, T. neglecta,* and *T. vario-picta* are doubtless mere colour varieties. Four of the forms are figured in B. R. 1990, under name of *T. scabriscapa.*

FIG. 125. TULIPA SUAVEOLENS, showing Habit and detached Flower.

T. suaveolens (sweet-smelling).* Van Thol Tulip. *fl.* fragrant; perianth red and yellow, large, with six equal, oblong, acute segments; stigma large; peduncle very downy. March and April. *l.* broad. *h.* 6in. South Europe, 1603. See Fig. 125. (B. M. 839; F. d. S. 1223.) Mr. Baker regards this as the original stock of many of our early-flowering garden forms.

T. s. latifolia (broad-leaved). A synonym of *T. pubescens.*

T. sylvestris (sylvan).* Wild Tulip. *fl.* fragrant; perianth bright yellow, 2in. long, the segments elliptic-lanceolate; filaments woolly at base. April and May. *l.* few, 6in. to 10in. long, linear, ½in. to 1in. broad, glaucous. Stem 1ft. to 2ft. long, terete, flexuous. Bulb small, ovoid, stoloniferous; scales chestnut-brown. Europe (Britain). See Fig. 126. (B. M. 1202; Sy. En. B. 1520.) SYN. *T. fragrans.* Forms with two-flowered peduncles are not uncommon in cultivation.

FIG. 126. TULIPA SYLVESTRIS, showing Habit and detached Flower.

T. s. tricolor (three-coloured). A synonym of *T. patens.*

T. thianschanica (Thians-chan). *fl.*, perianth segments obovate-oblong, obtusely or minutely apiculate, less than 1in. in length; peduncle glabrous, much shorter than the leaves. *l.* three, linear-lanceolate, falcate, minutely denticulate on the edge. Bulb having its outer tunics strigose towards the tip. Thian-schan Mountains.

T. tricolor (three-coloured). A synonym of *T. patens.*

T. triphylla (three-leaved). *fl.*, perianth bright lemon-yellow inside, tinged with green outside, rather funnel-shaped, erect, 1in. to 1¼in. long, the outer segments oblong and sub-acute, the three inner more obtuse; stamens less than ½in. long; peduncle glabrous, very slender. March. *l.* three or four, crowded near the base of the peduncle, falcate, linear, 3in. to 4in. long, ¼in. to ½in. broad. Bulb small, with a few hairs inside the outer tunics. *h.* 6in. to 8in. Central Asia. (B. M. 6459; R. G. 942.)

T. t. Hoeltzeri (Hoeltzer's). *fl.* small; perianth yellow, the three outer segments purplish. *l.* linear-oblong, glaucous, undulated, lying on the ground. Turkestan, 1884. (R. G. 1144, figs. 3, 4 a-b.)

T. turcica (Turkish). A synonym of *T. Gesneriana Dracontia.*

T. turkestanica (Turkestan). *fl.* one to six. *l.* two, falcate, lanceolate. Bulb small, ovoid, the outer tunics densely hairy inside. Chiva. A near ally of *T. biflora,* from which it mainly differs in the long cusps of the valves of its capsule. (R. G. 1050, fig. 2.)

T. undulatifolia (undulated-leaved). *fl.*, perianth bright crimson-red inside, greenish-red outside, campanulate, 1½in. to 2in. long, the uniform segments gradually narrowed to an acute point, a black blotch with a yellow border covering the whole claw; stamens ½in. long, with black filaments and very small anthers; peduncle glabrous or pubescent. May. *l.* three, glaucous, lowest lanceolate, 6in. long, 1in. broad, with a concave face and undulated margins. Stems 6in. to 9in. long. Smyrna, 1877. (B. M. 6308.) There is a form with less acute perianth segments.

T. uniflora (one-flowered). *fl.*, perianth segments pale yellow inside, oblanceolate, obtuse, ¾in. to 1in. long, the three outer strongly tinged with green on the outside and spreading in the expanded flower; peduncle erect. April. Stem slender, one-flowered, with a couple of spreading, lanceolate leaves from its middle. Bulb small, ovoid, with brown, membranous tunics produced far above its neck. Altai Mountains. SYN. *Orithyia uniflora* (R. G. 906, figs. 2-5; S. B. F. G. ser. ii. 336).

T. vario-picta (variously-painted). *A form of T. strangulata.*

VARIETIES. Subjoined are selections from the most showy and generally useful varieties that are adapted for pot-culture and, with very few exceptions, for planting in outside beds.

Single Early-flowering and Bedding Tulips. ARTUS, brilliant dark scarlet, very handsome and effective, large. BACCHUS, rich dark crimson; splendid bedding variety. BELLE ALLIANCE, crimson-scarlet; dwarf, early, and lasts long. CANARY BIRD, clear rich yellow; early. CHRYSOLORA, deep yellow, large, handsome; one of the best. COTTAGE MAID, rose-pink and white, flaked, very pretty. COULEUR CARDINAL, crimson-scarlet, very showy and effective, extra fine. CRIMSON KING, bright crimson, very showy. DUC VAN THOL (scarlet), very early, and one of the best for early forcing. JOOST VAN VONDEL, crimson, flaked with white, magnificent. KEIZERSKROON, intense scarlet, bordered with yellow, immense; a splendid variety, which lasts long in perfection. LAC VAN RHYN,

Tulipa—*continued.*

dark violet, silvery-white margin. LE MATELAS, deep rose, flushed white, very beautiful; excellent for forcing. L'IMMACULÉE, white; very early, good for forcing. PAUL POTTER, beautiful rose-magenta, distinct and fine. POTTEBAKKER WHITE, pure white, large, handsome; early. PRINCESS MARIANNE, creamy-white, large, handsome. PROSERPINE, rosy-carmine, very large, handsome; one of the best. QUEEN VICTORIA, rosy-white; good bedder. ROSE APPLATI, rose, very large, handsome. ROSE GRIS-DE-LIN, rose, shaded with white, very fine. ROSE LUISANTE, fine, deep rose; splendid forcing variety. ROYAL STANDARD, white, feathered with rosy-crimson, showy. THOMAS MOORE, orange-scarlet, very pretty, and quite distinct. VAN DER NEER, rich violet, very handsome, extra. VERMILION BRILLIANT, dazzling scarlet; good forcing variety, very early. WOUVERMAN, violet-purple, large. YELLOW PRINCE, golden-yellow; fine for forcing, very sweet-scented.

Double Early-flowering and Bedding Tulips. COURONNE DES ROSES, shaded rose, very fine and handsome. CRAMOISE SUPERBE, crimson; fine bedder. DUKE OF YORK, deep rose, edged with white, showy and effective; late-flowering. GLORIA SOLIS, orange-crimson, deeply edged with golden-yellow. IMPERATOR RUBRORUM, crimson-scarlet, extra fine. LA CANDEUR, white, very double, fine; rather late-flowering. LEONARDO DA VINCI, crimson-edged, golden-yellow, very fine. MURILLO, rosy-white; excellent for forcing. PÆONY GOLD, golden-yellow, feathered crimson, fine; rather late. PRINCESS ALEXANDRA, crimson, edged with golden-yellow, fine. PURPLE CROWN, rich purplish-crimson, very large and effective; rather late. REX RUBRORUM, brilliant crimson-scarlet; highly effective in beds; rather late. ROSINE, rosy-pink; fine for bedding. SALVATOR ROSA, dark rose; one of the best double rose varieties. TOURNESOL, scarlet, edged with yellow, large and handsome; the best double variety for forcing. TOURNESOL YELLOW, yellow, suffused reddish-orange, large. YELLOW ROSE, bright golden-yellow; late-flowering.

Parrot Tulips. These are very effective in borders and shrubberies, but are not adapted for pot-culture. They produce large, brilliantly-coloured flowers. Amongst the best are: ADMIRAL DE CONSTANTINOPLE, red, tipped with yellow; FEU BRILLANT, crimson; LUTEO MAJOR, yellow, slightly striped crimson and green; MARK GRAAF, yellow, striped scarlet and green; MONSTRE ROUGE, crimson, large; PERFECTA, yellow, scarlet, and green.

TULIP, AFRICAN. A common name for **Hæmanthus** (which *see*).

TULIP-BEARING MYRTLE. *See* **Darwinia macrostegia.**

TULIP, BUTTERFLY. A popular name for **Calochortus lilacinus** (which *see*).

TULIP, DROOPING. A common name for **Fritillaria Meleagris** (which *see*).

TULIP, GOLDEN STAR. A common name for **Calochortus pulchellus** (which *see*).

TULIP-TREE. *See* **Liriodendron tulipifera.**

TULIP-TREE, LAUREL-LEAVED. A popular name for **Magnolia** (which *see*).

TULIP, WILD, OF CALIFORNIA. A common name for the genus **Calochortus** (which *see*).

TUMBOA. A synonym of **Welwitschia** (which *see*).

TUMID. Swollen.

TUNGA. A synonym of **Hypolytrum** (which *see*).

TUNHOOF. A common name for **Nepeta Glechoma** (which *see*).

TUNIC. A coat; a seed cover.

TUNICA (from *tunica*, a coat; in reference to the overlapping of the floral envelopes). ORD. *Caryophylleæ.* A genus embracing about half-a-score species of hardy, annual or perennial herbs, natives of mostly Southern Europe and Western Asia. Flowers smaller than those of *Dianthus*, cymose-paniculate, glomerate, or capitate; calyx obtusely five-toothed; petals five, with elongated claws, and retuse or emarginately bifid blades; stamens ten. Leaves narrow. The under-mentioned species thrives in any light soil, and on old walls, ruins, &c. It is also adapted for planting on rockwork, and at the front of mixed borders. Propagated readily from seeds.

Tunica—*continued.*

T. Saxifraga (Saxifrage-like). *fl.*, calyx campanulate, the teeth triangular-ovate; lamina of corolla pink, short, retuse or erose. July. *l.* scabrid, narrow-linear, acute. Stems numerous, ascending or diffuse, paniculate. Central and South Europe. Perennial.

TUNICATED. Having a coat or coats.

TUPA. Included under **Lobelia** (which *see*).

TUPELO-TREE. *See* **Nyssa.**

TUPIDANTHUS (from *tupis*, *tupidos*, a mallet, and *anthos*, a flower; referring to the shape of the flower buds). ORD. *Araliaceæ.* A monotypic genus. The species is at first a small, glabrous, erect tree, afterwards a lofty climber. It thrives in sandy loam. Propagation may be effected by cuttings, inserted in sand, under a bell glass, in heat.

T. calyptratus (calyptrate). *fl.* green; buds ⅝in. in diameter, nearly globose; stamens fifty to seventy: main umbel about three-rayed, the branches 3in. long, very stout, with large bracts at their bases; partial umbels five to seven-cleft. *l.* digitate; leaflets seven to nine, entire, 7in. by 2½in., narrow-oblong, shortly acuminate, narrowed at base; petiolules 2in. long. India, 1855. (B. M. 4903.)

TUPISTRA (from *tupis*, a mallet; alluding to the peculiar form of the stigma). Mallet Flower. SYN. *Platymetra.* Including *Macrostigma* (of Kunth). ORD. *Liliaceæ.* A genus embracing three or four species of stove, perennial herbs, inhabiting the Himalayas or Burmah. Flowers sessile, clustered; perianth violet or lurid, campanulate, with a broad, scarcely contracted tube, and six, rarely eight, short, spreading, sub-equal lobes; stamens six or eight; spike terminal, dense, cylindrical; scape short or elongated, erect or recurved at apex, simple. Leaves radical, long, ample, contracted into the petioles. Rhizome thick. The two species known in cultivation thrive in rich loam; they may be increased by suckers, or by division of the plants, in spring.

T. macrostigma (Macrostigma). *fl.*, perianth dark purple, ½in. across, campanulate; spike drooping, lax, 2in. to 3in. long; peduncle dark purple, erect, as long as the spike. December. *l.* lanceolate, acute, chartaceous, above 1ft. long, bright green; petioles dilated at base, firm, erect, 6in. or more long. Rhizome creeping, much-branched. Khasia, 1876. (B. M. 6280.) SYN. *Macrostigma tupistroides* (R. G. 192).

T. nutans (nodding). A synonym of *T. squalida.*

T. squalida (squalid). *fl.*, perianth lurid-violet, or with the tube greenish, six to eight lines long; bracts large, scarious, deltoid; spike dense, nodding, 3in. to 6in. long; scape 3in. to 6in. long. March. *l.* oblanceolate, erect, 2ft. to 3ft. long, 2in. to 4in. broad, long-petiolate, narrowed at both ends. Rhizome fleshy. Himalayas, 1820. (B. M. 1655; B. R. 704; L. B. C. 515.) SYN. *T. nutans* (B. M. 3054; B. R. 1223).

TURBINATE. *See* **Top-shaped.**

TURF. A term applied to grass sods which are laid over the surface of ground to form lawns, edgings, verges, &c. Laying or cutting out flower-beds in Turf is a familiar operation. Turf is also cut from fields, and stacked in heaps for decomposing and forming loam, which is in daily request for potting and various other purposes. When used for forming new lawns, &c., that are to be kept mowed, it is most important that the Turf should be as free as possible from weeds, such as Daisies, Plantains, and the like. Pasture land which has long been laid down, and the grass closely eaten off by sheep or deer, is generally the best, as, provided the soil is fairly good, the more grazing or cutting is practised, the more dense does the Turf become at the root, and this is, of course, most favourable to the quick formation of a new lawn. The ground should be first prepared, made thoroughly firm by treading, and raked fine, before the Turf is laid. Autumn, and any favourable weather during winter and early spring, are best suited for the work. A handy size for cutting Turfs, when they are sufficiently tough for rolling, is 3ft. long by 1ft. wide; they are best cut with a turfing-iron, or, what is worked in a similar way, a turf-plough. Small squares (about

Turf—*continued.*

9in.) are readily fitted together, and are often preferable to 3ft. lengths. All the interstices should be filled in with fine soil, swept with a birch broom, and then the whole surface may be rammed or beaten with a turf-beater. It is important to get newly-laid Turf consolidated, and the pieces all fitted together, while the ground is moist. If from any cause Turf should have to be laid late in spring, or during summer, it often becomes dried up, and the pieces separate from each other; the work should not, therefore, be left until those seasons, if it can be avoided. It is of little use watering from the top in summer, but new Turf may be more readily re-established at that season by watering the ground first, and then laying the sods on the top.

TURF-BEATER, or **TURF-BEETLE.** This is used for beating the surface of newly-laid turf, to consolidate and render it level. A Turf-beater may easily

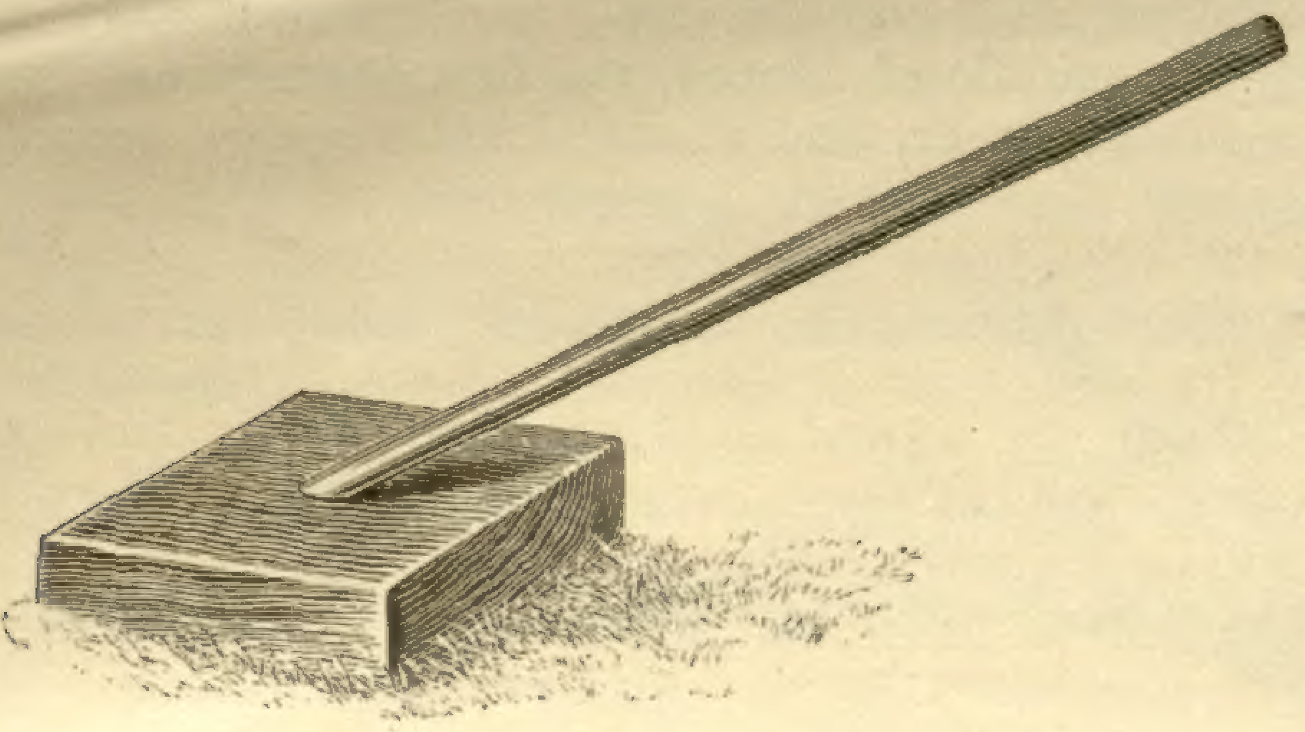

FIG. 127. TURF-BEATER.

be made from a flat, oblong piece of wood 3in. thick. A strong handle should be fixed into the centre of the upper side at an angle sufficiently acute to allow the Beater to be brought down flat on the turf when in use (see Fig. 127).

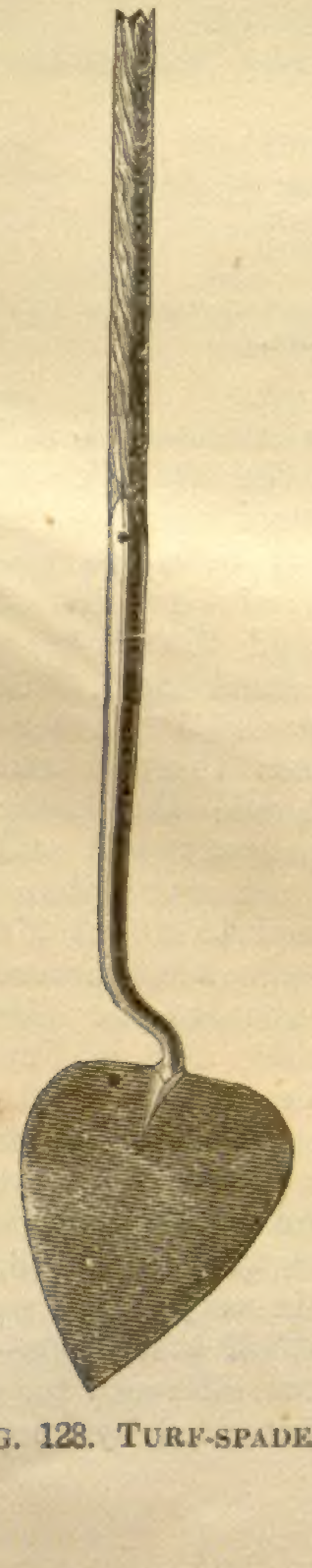

FIG. 128. TURF-SPADE.

TURF-RASER. A useful implement where a large quantity of turf has to be cut; it is employed for marking out the proper width for cutting in strips, and is used by a person who works in advance of others lifting the turf. A very simple form, but still one which answers most effectually, consists of an ordinary wooden handle with the point of an old scythe fixed into one end of it, at nearly or quite a right angle. This blade cuts into the turf at a uniform depth, and is guided along a line by the workman using it.

TURF-SCRAPER. A Scraper, made of wood or iron, similar to those used for roads, answers equally well for scraping lawns when worm-casts or ant-hillocks abound. A Turf-scraper is not, as a rule, otherwise required.

TURF-SPADE, or **TURFING-IRON.** An implement used for lifting turf that has previously been cut through with an edging-iron or a turf-raser. It has a bent handle, and a heart-shaped, flat blade (see Fig. 128), and is much handier for the purpose than an ordinary spade, as, if properly used, any quantity of turf may be cut of about a uniform thickness.

TURF-WALKS. Walks formed of turf instead of gravel, stones, or other hard substances. They require in formation exactly the same preparation as lawns, with, of course, the width limited. Occasionally, but not very frequently, Turf-walks are introduced into kitchen gardens.

TURGID. Swollen; puffed up.

TURGOSEA. Included under *Crassula.*

TURIO. A scaly sucker, which afterwards becomes a stem, as in Asparagus.

TURKEY CORN. A popular name for **Dicentra formosa** (which *see*).

TURKEY OAK. *See* **Quercus Cerris.**

TURK'S CAP. *See* **Melocactus communis.**

TURK'S HERB. An old name for **Herniaria glabra** (which *see*).

TURMERIC. *See* **Curcuma.**

TURMERIC ROOT. A common name for **Hydrastis canadense** (which *see*).

TURNERA (dedicated by Linnæus to the memory of William Turner, author of a "New Herbal," 1551; he died in 1568). Including *Piriqueta.* ORD. *Turneraceæ.* A genus comprising about seventy species of stove herbs, sub-shrubs, or shrubs, all tropical American, with the exception of one found in South Africa. Flowers yellow, axillary, solitary, rarely racemose or fascicled; calyx five-parted; petals five, inserted in the throat of the calyx; stamens five, inserted below the petals; peduncles free or connate with the petioles. Leaves scattered, entire, serrated, or sub-pinnatifid, often biglandular at base. Most of the Turneras have a weedy aspect, but those here given are rather pretty subjects when in flower. They thrive in any light soil. Propagation may be effected by seeds, which are freely produced; the shrubby species may also be increased by cuttings, inserted under a hand glass, in heat; and the herbaceous perennials either by cuttings or by divisions.

T. trioniflora (Ketmia-flowered). A synonym of *T. ulmifolia elegans.*

T. ulmifolia (Elm-leaved).* West Indian Holly or Sage Rose. *fl.* almost sessile, about the size of those of *Reinwardtia trigynum;* peduncles bibracteate, connate with the petioles. June to September. *l.* oblong, acute, serrated, pubescent above, white-tomentose beneath, biglandular at base. *h.* 2ft. to 4ft. South America, 1733. Perennial herb. See Fig. 129. (B. M. 4137.)

Turnera—*continued.*

T. u. angustifolia (narrow-leaved). *l.* oblong-lanceolate. (B. M. 281, under name of *T. angustifolia.*)

T. u. cuneiformis (wedge-shaped). *fl.*, claws of the petals brownish. *l.* obovate-cuneate, coarsely serrated. *h.* 1ft. to 3ft. Brazil, 1821.

T. u. elegans (elegant). *fl.* sessile, as large as those of the Bladder Ketmia; petals pale yellow or sulphur-coloured, with purplish-brown claws. All the year. *l.* oblong-lanceolate, coarsely serrated, cuneate at base, quite entire, pubescent. *h.* 1ft. to 2ft. Brazil, 1812. SYN. *T. trioniflora* (B. M. 2106).

TURNERACEÆ. A natural order of glabrous or pubescent herbs or shrubs, mostly American, a few being African, and one broadly dispersed over Asia, but not indigenous. Flowers regular, hermaphrodite, axillary, solitary or few, sessile or pedunculate, rarely racemose; calyx tubular, five-cleft, deciduous, the lobes imbricated; petals five, inserted at the throat of the calyx, clawed, membranous, twisted, deciduous, naked or with a scale at the tip of the claw; stamens five, very rarely hypogynous; filaments free, flat-subulate; anthers oblong; ovary free, one-celled; styles three, filiform; peduncles free or connate with the petioles, occasionally jointed, often bibracteolate. Capsule one-celled. Leaves alternate, petiolate, simple or pinnatifid, often argutely serrated, frequently biglandular at base; stipules small or wanting. The order embraces three genera—*Erblichia*, *Turnera*, and *Wormskioldia*—and about seventy-six species.

TURNIP (*Brassica Rapa*). A hardy biennial, native of Europe (Britain), &c.; cultivated from a remote period, for the use of the fleshy roots, which are boiled and served as a vegetable in various ways. The tender growing tops are also gathered in spring, and cooked as a green vegetable; and they are sometimes blanched at the same season as a substitute for Seakale.

Cultivation. The Turnip is chiefly an autumn and winter crop, as it succeeds best in cool, moist weather; but early and successional supplies may be procured by commencing to sow early in spring, and keeping on at intervals until July. In summer, Turnips not unfrequently run to seed without forming roots of a useful size; and during dry weather they are, if procurable, often stringy, and of inferior quality. The destructive Turnip Flea has also to be contended against; all through early summer especially, its attacks are commenced on the seedlings so soon as they appear above ground. It is of little use

Turnip—*continued.*

attempting to force Turnips too early in spring: they should not be sown under glass until the weather is favourable for admitting plenty of air. The first supply may be obtained by sowing some seed broadcast in a frame, during February or early in March. The least bottom heat from fermenting material may be allowed, but a spent hotbed or cold frame, with from 3in. to 6in. of rather fine, light soil in it, will do; an early variety should be selected—Early Munich is one of the best. The seedlings require thinning out so soon as they are large enough to handle. Plenty of air must be allowed, to insure a sturdy growth, and when the leaves get strong the frame may be removed. The season will by this time be advanced and the weather warmer than at the period of seed-sowing. Attention to watering is the principal point in after-cultivation. A valuable supply may be thus obtained in advance of any that could be grown entirely in the open air; a two-light frame at least should be allowed, as it could scarcely be more profitably utilised.

By the middle of March, the first sowing may be made on a south border, and successional sowings according to requirements will be necessary until the end of June or early in July, when the seed for the main crop should be put in. In favoured districts, any time in July will do, and sowings may even be made up till the end of August with successful results. Turnip seed usually grows very freely, and the young plants appear above ground in a very short time. Some cultivators sow broadcast, but the ground is more readily kept free from weeds and the plants thinned out when the plan of having drills is adopted: the latter is therefore recommended. Drills 1ft. apart will suffice; they should be drawn with a hoe not more than 2in. deep, and the plants may be thinned to about 9in. apart, though this distance may vary somewhat according to the strength of the variety and the season. During summer a cool situation is preferable, and in dry weather it is often necessary to keep Turnips watered. If this is not done, growth becomes checked, and either the plants run to seed or the roots lose their succulent nature and become pithy. The main crop may be left in the ground, to be pulled when required, but for the purpose of having a supply in very severe weather it is advisable to lift a portion, cut off their tops—not too closely—and store them in sand or soil ready for use. The crops at all seasons are much benefited by keeping the soil between

FIG. 129. FLOWERING BRANCH OF TURNERA ULMIFOLIA.

Turnip—*continued.*

hoed and loose on the surface. Damp, dull weather is most favourable for Turnip cultivation; but as the crop is of much importance throughout the season, all that can be done during the summer to counteract the evil influences of drought should receive full attention. If two or three varieties are sown at the same time, sometimes one will thrive if another fails. Turnips succeed best in rich, rather light, loamy soils; ground which is stiff and retentive is not well adapted, as the roots do not attain a good flavour, and in the summer are more apt to run to seed; light, gravelly soils are also unsuitable.

Animal Pests. The animal foes of this valuable plant are both numerous and varied. A large proportion of them attack the roots. Ants are said to carry off the seed, and to endanger the crop at times; and sparrows and other seed-eating birds assist in such depredations. The germinating plants, so soon as they appear above the soil, are too often wholly destroyed by the **Turnip Flea or Fly** (which *see*), and by small Weevils, such as **Otiorhynchus** (which *see*), and *Ceuthorhynchus contractus,* which is nearly related to the Turnip-gall Weevil (*see* **Turnip Galls**) and **Turnip-seed Weevil** (which *see*). The best treatment for the destruction of these insects is mentioned under the above headings.

When the plants are somewhat larger, the leaves are often so eaten by numerous larvæ, that merely the larger veins remain, or, at least, large holes are gnawed in the leaves and other green parts, to the injury of the plants, and the consequent diminution of the root-crop. The larvæ (*see* **Cabbage Caterpillars**) of the White Butterflies (*Pieris Brassicæ, P. Napi,* and *P. Rapæ*) feed on the leaves of Turnips, as they do also on Cabbages; and they are assisted in this by the larvæ of various Night-moths, *e.g.*, of **Mamestra** (which *see*), and of **Plusia gamma** (which *see*) and others noted under the headings **Potherb Moths** and **Surface Caterpillars.** The larvæ of a small Moth, **Plutella cruciferarum** (which *see*), are very numerous in some localities, living under webs on the lower surfaces of, and eating holes in, the leaves.

Still more dangerous than the Butterflies and Moths is *Athalia spinarum,* the **Turnip Sawfly** (which *see*), the larvæ of which at times devastate entire fields. An allied species (*A. ancilla*) also proves destructive occasionally, though to a less extent.

Various Beetles assist in destroying the leaves of Turnips, chief among them being the **Turnip Flea** (which *see*); though Curtis accuses **Phaedon Betulæ** (which *see*) and *Otiorhynchus* of aiding in the harm done.

Besides the holes eaten through them, the leaves are often marked with white, wavy tracks, or mines, burrowed between the surface-membranes. These mines are the work of larvæ of small Flies (*Drosophila* and *Phytomyza*), and of the **Turnip Flea** (which *see*). The flowers inclosing the young ovaries are favourite resorts of numerous Beetles, some of which gnaw the various organs, devouring the ovaries, or rendering them unfertile. The flowers and flower-stalks, and, to a less extent, the leaves, are sometimes injured by more than one kind of plant-louse (*see* **Aphides**). The seeds are devoured in the seed-vessels, while soft, by larvæ of certain small Midges belonging to the group of Gall-midges (*Cecidomyidæ*), but these scarcely alter the form of the fruit. The larvæ of the **Turnip-seed Weevil** (which *see*) also devour the seeds in the fruit. From their concealed mode of life, little, if anything, can be done against those insects that feed on the seeds. But, while the green parts, the flowers, and the seeds, are all liable to serious injury from animals, and the roots thus suffer indirectly, the latter parts suffer from direct attacks even more seriously than do the other organs. All herbivorous quadrupeds eat them; and hares and rabbits are peculiarly hurtful where Turnips are grown in an insufficiently inclosed area. Rooks also greatly injure Turnips, by scooping out holes in them to obtain food during snowy weather. In localities near the sea-coast, a similar habit is frequently indulged in by sea-gulls. Among the most effectual protections against birds are threads stretched in zigzags near the soil, and decked with rags, or other fluttering objects, suitable to act as scarecrows.

Some account of the more destructive parasites of Turnip roots is given, along with the most successful remedies against each, under the headings **Slugs, Snails, Surface Caterpillars, Turnip Galls, Turnip Moths,** and **Wireworms**; and it would occupy unnecessary space to repeat what is contained in those articles. When the roots have begun to decay, the change is hastened by numbers of **Millipedes** (which *see*) and insects (chiefly larvæ of small Beetles and Midges) that feed in them, and soon reduce them to the condition of putrescent masses.

In Germany, it has been observed that Turnips and other Crucifers are liable to have the smaller side-roots more or less injured by the production of small, round galls on them, the work of a minute worm (*Heterodera Schachtii*), of which an account is given, and appropriate remedies are discussed, under **Nematoid Worms.**

Fungi. Turnips are liable to serious injury from the attacks of several species of Fungi, most of which have been already discussed in this work under headings quoted below. Almost all of them also infest Cabbages and cruciferous weeds—a circumstance that must be kept in mind in the means employed for preventing or curing diseases caused by them in Turnips. Of those that have proved peculiarly injurious in Great Britain, the more hurtful are the following:

Plasmodiophora Brassicæ (which *see*), producing "Clubroot," or "Finger-and-Toe," in the roots, of which they cause the early death and decay, so that the crop is largely, if not entirely, destroyed in severe attacks.

The leaves are frequently "mildewed." One form of "Mildew" is caused by the growth of the superficial mycelium of *Oidium Balsamii* (*see* **Oidium**), which is itself a young stage of an *Erisyphe* of some kind, of which the perfect condition is uncertain. The thread-like cells of the Fungus spread in a thin, whitish coat over the whole of both surfaces of the leaf, from which they draw their nourishment, without, however, traversing its tissues; and they injure it both by the nourishment they absorb from it, and by hindering free interchange of gases and fluid between the cells of its interior and the air. The leaves wither and dry up, and the plants are insufficiently nourished, with evil effects to the roots. For a remedy, *see* **Oidium.**

Peronospora parasitica gives rise to another form of "Mildew" on the leaves. This shows itself in whitish patches, which consist of erect stalks, much branched above, and bearing on the tips of the branches the nearly globose conidia or reproductive cells. The mycelium of the Fungus burrows among the inner cells of the leaf, and only the stalks just spoken of are seen on the surface, passing out through the stomata. The sexual reproduction of the Fungus is also provided for by the mycelium in the leaves, as described under **Peronospora.** The upper surface of the leaves is mildewed by this Fungus far less frequently than the lower; but the presence of the parasite is shown by yellowish-green or yellow patches on the surface. *P. parasitica* frequently grows in the flower-stalks and in the flowers, which, under its influence, become much distorted and swollen, and fail to produce seeds. All parts in which it grows are liable to premature death and rapid putrefactive decay in moist air. For treatment, *see* **Peronospora.**

White Rust is very often associated with *P. parasitica,* growing on the same spots of the plant, and

Turnip—*continued.*

actually intermingled with it; but frequently, also, they grow apart from one another. The White Rust resembles splashes of whitewash, when the conidia are matured on the diseased spots, which latter are usually swollen and distorted. It occurs on stems, leaves, and flowers. The Fungus (*Cystopus candidus*) is nearly related, in a good many points, to *Peronospora*. For an account of its structure, and of the treatment to be employed against it, *see* **Rust.**

The leaves frequently show spots or patches, often 1in. or more in breadth, at first yellowish, but soon becoming withered and dry. On these spots, the microscope shows minute Fungi. On some, there may be found slender conidia (with many septa, or cross-walls), on the tips of short threads, pushed through the stomata. This form of Fungus has been named *Cercospora Bloxami* by Messrs. Berkeley and Broome. On other spots occur small dark **Pycnidia** (which *see*), in which are produced small, oval, pale sporidia, one-celled (*Phyllosticta Brassicæ*), or two-celled (*Ascochyta Brassicæ*). The relations between the Fungi found on such patches are still very uncertain. Turnips do not suffer very seriously from the presence of these Fungi, as the latter seldom affect the young, vigorous leaves, but prefer the lower leaves when already half-dead. It is, therefore, unnecessary to dwell upon treatment, further than to mention that it is a wise precaution to destroy—if possible, by fire—all leaves overgrown with parasites.

Two other Fungi have been described as occasionally very injurious to Turnips in Germany, and a brief notice of them will not be out of place here. *Polydesmus exitiosus* is the name given by Dr. J. Kühn to a Fungus described by him as extremely injurious to Turnips, destroying both the leaves and the unripe seed-vessels. Very dark spots appear on the diseased organs; the spots spread, and the tissues become discoloured, and dry up. If the seed-vessels are attacked while young, the seeds do not ripen; but if the disease is late in its appearance, they may ripen, but are soon destroyed, the valves of the fruit shrivelling, and bursting away prematurely. In the diseased tissues, the mycelium of a Fungus is present in abundance, absorbing the nourishment in the cells, and destroying the cell contents and cell walls. From this mycelium rise erect branches, which project through the epidermis of the leaf, and bear, on their tips, conidia that vary much in form, but that, when mature, are clavate, being fixed by the broader end, and having the other prolonged as a slender filament; or there may be a series of from five to ten such conidia, end to end, forming a chain. The conidia are dull or brown-violet, and are divided into cells, by numerous cross-walls, and a few longitudinal ones. The conidia readily fall off the erect branches, and germinate speedily, in damp, warm weather, spreading the disease if they fall on green parts of Turnip-plants, under suitable conditions. This Fungus produces brown, withered spots in the parts affected, often surrounded by a yellow or reddish border. On these spots develop **Pycnidia** (which *see*) of *Phyllosticta Brassicæ*, and perithecia of a **Pleospora** (which *see*), perhaps *P. herbarum*. The only treatment possible is to endeavour to prevent future attacks, by destroying diseased parts of plants without delay.

Peziza sclerotiorum is blamed by Dr. Frank as the cause of a peculiar disease of Turnips, which was prevalent, near Leipzig, in 1879. The plants became yellow during July. The cause of this was a diseased state of the stems, commonly near the base, which manifested itself in a pale colour, and in a separation between the epidermis and the tissues below it. On breaking the stem, the pith is found occupied by a black, oval body, the sclerotium, from which the above *Peziza* grows out in the following spring. For an account of the structure of the Fungus, and of the treatment advised against it, *see* **Peziza.**

Sorts. These are very numerous, but it is unnecessary to grow many varieties if attention is given to include those which are adapted for early use, and others for main crops. The shapes and outside colours vary in the different sorts; but this is of little importance, provided the inner flesh is of good quality. The flesh is either white or yellow: white-fleshed varieties are generally preferred in the southern division of the country, while yellow ones are more largely cultivated in the north.

FIG. 130. EARLY STRAP-LEAVED WHITE STONE TURNIP.

CHIRK CASTLE BLACK STONE, skin black; very fine and hardy. EARLY PARIS MARKET, white, oblong in shape; early, a much-esteemed French variety. EARLY PURPLE-TOP MUNICH, distinct and very early; one of the most valuable for frame culture and for early crops, the produce is at its best when about half or three-parts grown. EARLY RED AMERICAN STRAP-LEAVED STONE,

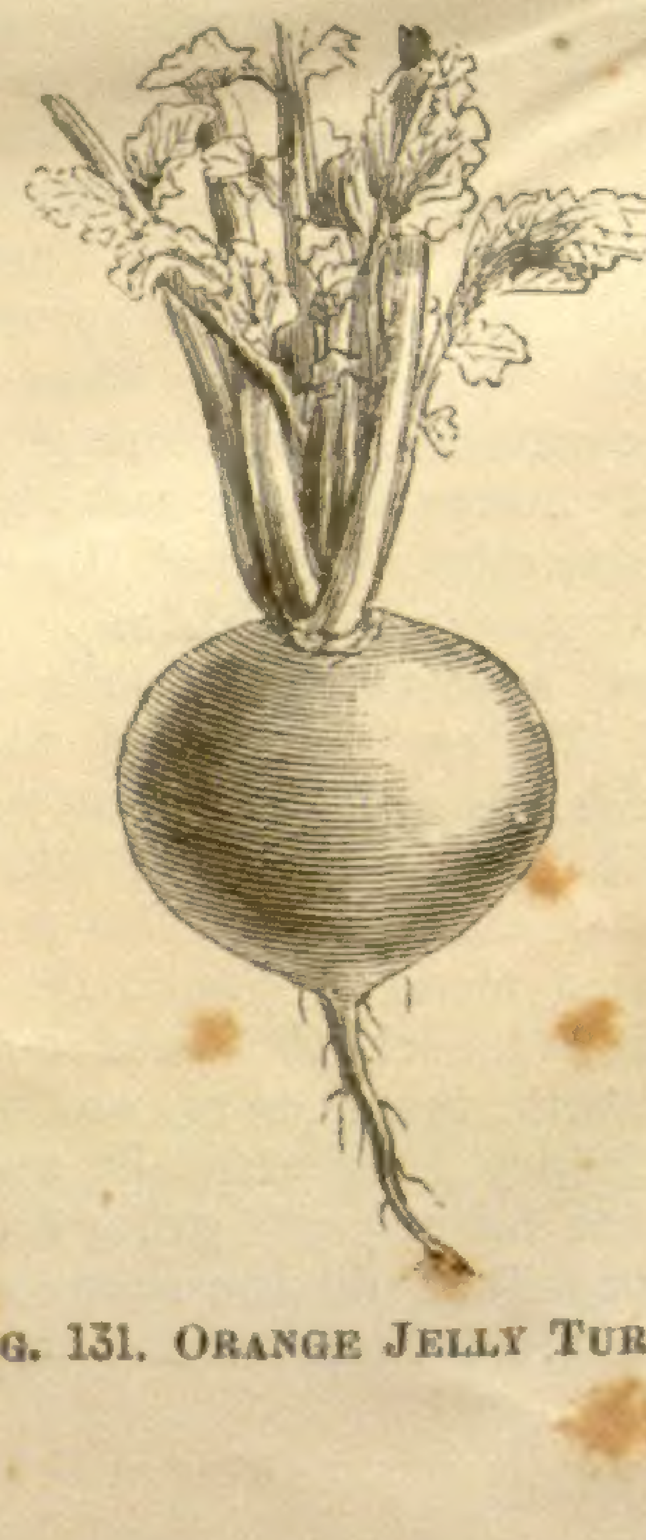

FIG. 131. ORANGE JELLY TURNIP.